Paper
TRADE JOURNAL

Mar. 16, 1951

CAN YOUR FLOW METERING PROBLEMS BE SOLVED?
See Page 22

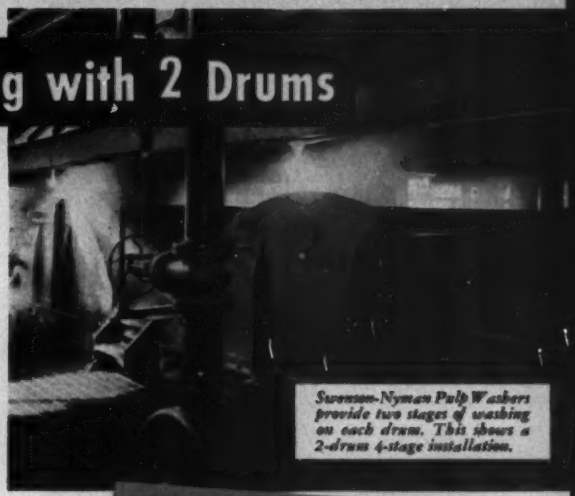
HOW CAN THE LIFE OF YOUR SUCTION ROLLS BE PROLONGED?
See Page 30

4-Stage Pulp Washing with 2 Drums

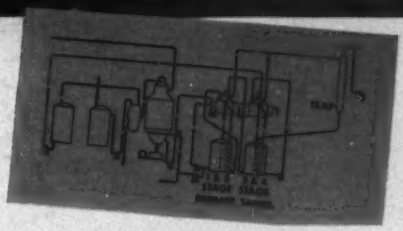
CLEANER STOCK
LESS DILUTION
NO SEWER LOSS

Swenson-Nyman Pulp Washers have these outstanding features . . .

- ✔ Two-stage countercurrent washing on each drum
- ✔ Strong and weak liquors handled separately
- ✔ Independently controlled vacuum on each stage
- ✔ Uniform distribution of vacuum across entire sheet
- ✔ Pulp picked up at low submergence level
- ✔ Uniform pickup and sheet formation
- ✔ Large washing area—twice sheet-forming area
- ✔ Low point of sheet discharge—at centerline of drum



Swenson-Nyman Pulp Washers provide two stages of washing on each drum. This shows a 2-drum 4-stage installation.



Send for Bulletin E-108

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- Digester Blow Condensers
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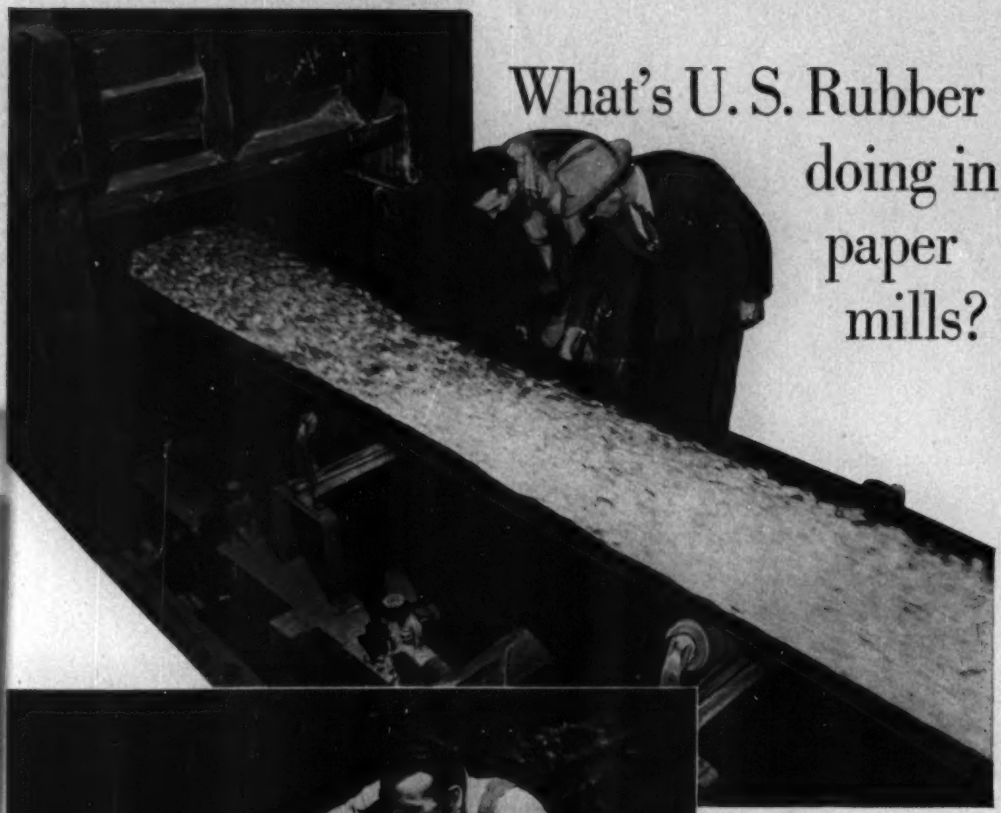
What's U. S. Rubber doing in paper mills?



Here a U. S. Belting engineer is examining the U. S. Giant belt, the idlers and the take-up during a periodic inspection. The inspections are a part of "U. S." service, which continues throughout life of the belt.

U. S. Belt engineer checks clearance of the U. S. Royalite Skirt Board rubber which guides the load on the belt and prevents spillage. This belt carries hog fuel to boiler room.

Conveying tons of wood chips to storage bins and hog fuel to boiler rooms, as in this particular mill.

The consistent dependability of the U. S. Giant Conveyor Belts that do these jobs is one of the main reasons why this paper mill, in the State of Washington, runs steadily day and night.

Thousands of U. S. Conveyor and Elevator Belts in large and small installations are contributing to lower conveyor costs and valuable savings in time and labor. Whatever your particular belt problem may be, you can depend on "U. S." Write to address below.

PRODUCTS OF

U.S. RUBBER

SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Pump Heavy Stock with No Dilution . . No Thickening

THIS STOCK PUMPING COMBINATION of the *Hi-Density* Feeder and the Allis-Chalmers PW paper stock pump saves money on stock pumping three ways:

1) Eliminates need for diluting stock for pumping and subsequent thickening for processing.

2) Saves expense of manufacturing and handling wet lap for thickening.

3) Stock can be stored at higher consistence and pumped to the beaters at desired consistence.

The *Hi-Density* Feeder is a shaft and multiple vane assembly that is installed in the stock chest. It feeds pulp as thick as 8% bone-dry consistence into the pump suction. The PW pump can easily handle this stock once it has been fed into the suction.

The PW pump is especially designed for paper stock handling. It has a non-clogging type impeller and is available in several special alloys to suit every type of paper making application. The entire rotating element can be removed in 5 minutes without disturbing the suction or discharge piping.

For help on your stock pumping problems — or on any of the many other paper making processes for which A-C manufactures equipment — call your nearby Allis-Chalmers Sales Office or write Allis-Chalmers, Milwaukee 1, Wis. Ask for Bulletins 08B7112 and 08B6725.

A-2331

Hi-Density, Texrope and Streambarker are Allis-Chalmers trademarks.

ALLIS-CHALMERS

Lubricate paper machines with the oil that keeps bearings clean — TEXACO URSA OIL X**

In mill after mill, operators have found that charging paper machine circulating systems with *Texaco Ursa Oil X*** has eliminated the "dirty bearing" troubles caused by other oils and has assured complete freedom from unscheduled shutdowns.

First of all, *Texaco Ursa Oil X*** does an outstanding lubricating job. Inspection after long use has revealed bearings actually in good-as-new condition — fully protected against wear and rust. In addition, *Texaco Ursa Oil X*** cleans as it lubricates. Its fully detergent and dispersive properties keep paper dust, carbon and water from accumulating in either bearings or oil lines.

*Texaco Ursa Oil X*** thus reduces maintenance costs and assures the savings that come from uninterrupted production. It is recommended by leading paper machine manufacturers.

In your enclosed gear drives, use *Texaco Meropa Lubricants*. They have very high resistance to oxidation and thickening, and will not foam. Your maintenance costs will come down.

A Texaco Lubrication Engineer will be glad to help you set up cost-saving lubrication procedures throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR THE PAPER INDUSTRY

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

Paper TRADE JOURNAL

Vol. 132 **MARCH 16, 1951** **No. 11**

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NEXT WEEK

An interesting description of some of the methods, including the latest developments for producing pulp from straws, grasses, bagasse, etc. is contained in "Twenty-five Years Pulping Developments of Agricultural Residues" by F. G. L. Becker, Cellulose Development Corporation, London, England.

REMEMBER THESE DATES

MARCH 31: Commercial Chemical Development Ass'n Meeting at the Roosevelt Hotel, New York City.

APRIL 2-4: National Paper Trade Assn., Annual Convention, Waldorf Astoria, N. Y. C.

APRIL 17-20: American Management Assn., 20th Nat'l. Packaging Exposition, Auditorium, Atlantic City, N. J.

APRIL 30-MAY 4: Materials Handling Conference; Held concurrently with Nat'l. Materials Handling Expo., International Amphitheatre, Chicago, Ill.

MAY 4-5: American Pulp & Paper Mill Supts. Ass'n, Northwestern Div., Spring Meeting, Radisson Hotel, Minneapolis, Minn.

MAY 7-13: Forest Products Research Society, Annual Meeting and Industry Show of 1951, Convention Hall, Philadelphia, Pa.

MAY 11-12: American Pulp & Paper Mill Supts. Ass'n., Penn. New Jersey-Delaware Div., at Hotel Easton, Easton, Penna.

MAY 15-16: American Institute of Chemical Engineers, Regional Meeting, Hotel Muehlebach, Kansas City, Mo.

JUNE 3-6: National Paper Box Mfrs. Assn., Haddon-Hall, Atlantic City, N. J.

JUNE 24-28: Superintendents National Convention, Multnomah Hotel, Portland, Ore.

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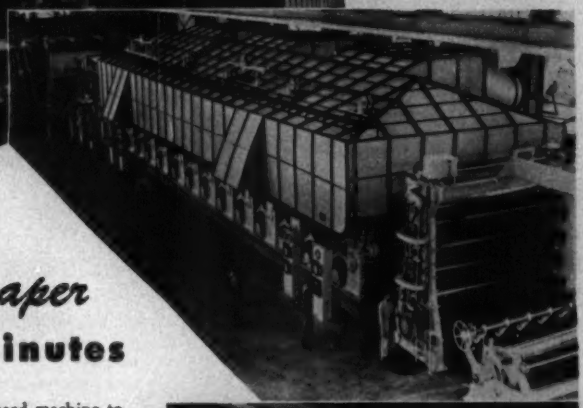

Saleable paper
in a matter of minutes

The ability of a Black-Clawson board machine to produce saleable paper in a matter of minutes from start-up is not just "horseshoes." It invariably happens so it must be based on something far more substantial than just luck—and it is—on the following facts:

Certain exclusive design features.

Exceptionally close engineering and shop supervision.

Pre-erection and match-marking of parts to speed erection at the mill and assure perfect fit of all components.

That's why Black-Clawson machines "get down and go" on start-up day.

Cylinder machines. Fourdrinier machine drives. Calenders, Reels, Cutters, etc.

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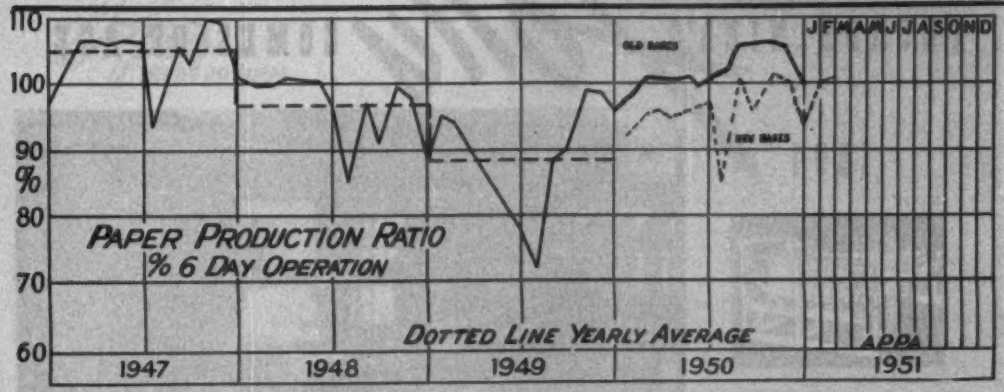


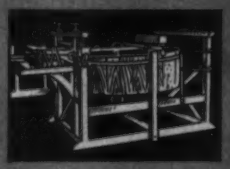
Weekly Brief of Important Figures

Source	Production	WEEK ENDING Mar. 3, '51	Feb. 3, '51	Mar. 4, '50
APPA	Paper Production Percent Capacity[2]	102.7	100.3	95.8
	Unbl. Kraft Paper Production Percent	98.8	98.7	93.3
NPA	Paperboard Operating Ratio Percent Inch Hours	105	103	91
		Jan. 1951	**Dec. 1950**	**Jan. 1950**
APPA	Paper Production[6] (Except Newsprint and Building Papers) Tons	892,000	828,155	778,408
	New Orders Tons	936,360x	823,397	788,763
	Unfilled Orders Tons	910,835x	859,475	509,600
	Shipments Tons	885,000	841,777	765,803
		Feb. 1951	**Jan. 1951**	**Feb. 1950**
NPA	Paperboard Production Tons	977,946	1,176,679	817,000
	New Orders Tons	987,609	1,349,991	802,800
	Unfilled Orders Tons	758,562	751,828	314,600
	Our Customers Activities Index[1]	**Latest Mo.[5]**	**Previous Mo.[5]**	**Year Ago[5]**
FRS	Manufactures Total Index	227	225	186
	Durable Mfg. Index	266	260	201
	Nondurable Mfg. Index	195	197	175
	Chemical Products Index	284	283	249
	Mfg. Food Products Index	158	164	156
	Printing and Publishing Index	180	182	162
ODC	Magazine Advg.-Printer's Ink Index	319	342	291
	Retail Sales Combined Adjusted Index	343.4	323.9	302.3
	Drug Index	224.5	219.9	218.1
	General Merchandise Group Index	332.5	312.7	294.6
	Grocery and Combination Index	424.4	399.5	361.9
	Prices Index			
BLS	Consumers Price Index[1]	178.4	175.6	167.5
	Wholesale all Commodities[3]	175.3	171.7	151.2
	Wholesale Foods[3]	179.1	175.2	155.7
	Commodities other than Farm Products and Foods[3]	166.6	163.7	145.4
	Wholesale Pulp and Paper[3]	189.0	178.7	156.0
	Purchasing Power of Dollar, Consumers Prices[1]	56.1	56.9	59.7
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	414.9	415.8	329.3
	Unemployment Compensation Initial Claims (M)	1,051	907	1,630
	Miscellaneous Carloadings–Thousands of Cars	1,814	1,569	1,542
	Electric Output (Million KW hr.)	35,779	34,072	31,162
PTJ	Average 32 P & P Common Stocks as of Mar. 6	$38.48	$38.33	$31.29
	Average Indicated Dividends Common Stocks as of Mar. 6	$ 2.39	$ 2.39	$ 2.29

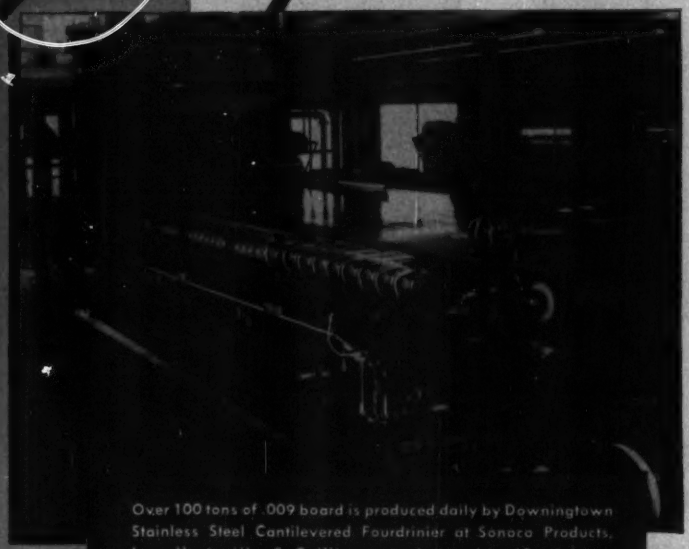
[1] 1935-39=100 Unadjusted Index
[3] 1926=100
[4] New 6-7 day basis.
[5] For details see APPA Monthly Statistical Summary
[6] Latest Month Available on Request
x Revised figures.

FOURDRINIER'S Folly COMES OF AGE

1804



THE DOWNINGTOWN STAINLESS STEEL CANTILEVERED FOURDRINIER REACHES NEW HIGHS IN DESIGN AND MATERIAL IMPROVEMENTS



Over 100 tons of .009 board is produced daily by Downingtown Stainless Steel Cantilevered Fourdrinier at Sonoco Products, Inc., Hartsville, S. C. Wires are changed in 40 minutes.

What sceptics once called "Fourdrinier's Folly", has reached its highest point of development in the new Downingtown Stainless Steel *Cantilevered* Fourdrinier, which is setting records for flexibility, production, low maintenance costs and short "down time" for wire changes.

Corrosion, an important cause of excess "down time" for repair and replacements, has been effectively taken care of through the extensive use of stainless steel. In the Downingtown Stainless Steel *Cantilevered* Fourdrinier this highly corrosion resistant metal is used in suction boxes, head box, distributing rolls, high and low head suction slices, tubular shake rails and savealls.

The many design improvements and speed range from 150 to 1500 FPM make this machine unusually versatile . . . able to handle wide varieties of stock at speeds best suited for maximum production.

Consult your Downingtown engineer now about designs and costs for installing this modern Fourdrinier or write for complete information.

More Downingtown FOURDRINIER FEATURES

- **Dual Suction Box Couch Roll**
- **Flow Spreader**
- **Multiple Passes**
- **Foam Shower**
- **Faster Wire Changing**
- **In-operation Level Adjustment**
- **Improved Shake Rails**
- **Balanced Wire Rolls**
- **Motor-operated Stretchers**
- **Piping not disconnected when changing wires**

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Bldg., Portland 4, Oregon.

DOWNINGTOWN

High point in flexibility

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, March 14, 1951.

The problem of raw materials lack, in the face of sustained paper and board demand, worsens daily. A change, however, is indicated in current business thinking. More men are getting their heads out of production bedlams and evaluating their position in the light of general business trends and the "ifs" of international events.

Is business heading for the dip which was forecast last Fall? If so, how deep is it likely to be? Where is all the paper and board going? Are there evidences of heavy inventory building which point to a back-up while we are at capacity production? These and more are questions which industry leaders were asking last week as they studied January production figures and March supply conditions.

Rush to Buy Has Abated

The rush to buy at retail has abated since the price freeze was ordered on January 26, says the Monthly Letter of National City Bank. Slackening in wholesale trade has been more pronounced. . . . Buyers all along the line have been anticipating requirements, increasing commitments and enlarging inventories. Businessmen know that buying may be overdone, that some change in the international situation might make inventories look less desirable, and notes of caution are being uttered.

Dun & Bradstreet Reports Easing

A slight dip in consumer buying at retail in various parts of the nation was noted in latest report of D&B, despite early Easter buying. An easing was reported also in wholesale buying; many retailers reporting ample stocks. A sharp curtailment of further bookings for spring and summer styles was noted. Many retailers reduced bookings of television sets, refrigerators and large appliances in general. Demand for housewares increased. Also reported from the N.Y. garment and textile industries is a decided easing in buying.

Inventory Position Studied

Manufacturers' shipments and new orders expanded sharply in January, and inventory book values increased nearly a billion dollars, the OBE reported last week. A spurt in consumer buying and accelerated defense procurement were factors. Higher prices affected dollar figures.

Based on reports of 2,973 establishments reporting to the Bureau of the Census, wholesale inventories were 26 percent above the dollar value of stocks on hand January 31 of 1950, ranging from 17 percent to 38 percent by geographical divisions. For the 58 establishments reporting on paper and its products, a 51 percent gain in dollar volume of sales is reported for January, 1951, over January, 1950.

It is significant, however, that paper inventories reported by these same 58 houses showed a gain of only 8 percent over a year ago by dollar volume. New England noted no percentage gain in the 4 houses reporting; the Middle Atlantic gained 18 percent; East North Central lost 1 percent; Pacific gained 23 percent.

New York Inventory Trends

It is stated with definiteness that there is no inventory of coarse papers in the New York area. Distributors say flatly that they have been unable to procure adequate supplies of tissues, kraft wrapping, corrugated, gummed tapes, etc., and their stocks have gone to industry for packing purposes, also to department stores. Should a dip in demand develop, producing mills would still have to restock coarse paper houses with practically their entire line.

It is stated with little deviation that most of the coarse paper produced during the last 12 months has gone into wrapping and packaging the output of general industry, that more supplies are needed for stock by these manufacturers, and that the distributors need stock from the floor up.

In fine papers, most dealers have been able to keep a fair inventory of bonds and ledgers and other fine papers. It is reported that some business houses are much overstocked on forms of all types.

Book paper, however, is another story. Advertising programs have gobbled up so much paper that printers have not sufficient stock to meet demands of new advertising. In view of the heightened publicity which accompanies a drop in consumer buying power, no lessening of demand is seen for some little time.

January Production Gains

January paper and board production (exclusive of newsprint and building paper), set an all-time record of 2,300,000 tons, an annual rate of 26,300,000 tons.

MRO, NPA Regulation 4, DO 97

Early interpretations of this order by one or more groups indicated that if printers could obtain DO 97 ratings from their customers' paper requirements, such orders could be extended to the mill for paper requirements. A similar application would be used for all packaging requirements.

It is believed in industry circles that a clarification of this order, as it pertains to paper, is on the way.

New Pulp Prices and Shortages

Lack of wood pulp already has shut down three writing paper mills in Massachusetts. With sulfur and wood shortages threatening pulp mill output, it is feared this is only the beginning.

Two major U. S. pulp mills have announced second-quarter prices at first-quarter levels. No word has come of Canada's prices, but there is a hint that forthcoming announcements may similarly hold the line.

Considerable stir has developed here and in Washington over reports that one Swedish mill had lifted its prices by over $100. If, it is said, our ECA dollars are buying Swedish pulp for Europe at inflated prices and thus setting the price for U.S. consumers, we're "not going to take this sitting down. It's a matter for the State Department." The exorbitant prices offered by South American buyers are not sizable enough to influence the price level for U. S. industry, it is said.

Noting that American industry needs Scandinavian pulp and the Nordic countries need dollar currency, *Svensk Travaru Tidning* stated in a recent issue that "it would be best if mutual concessions could lead to continued business."

It is believed in New York importing circles that such a compromise will be effected, and that the second quarter prices will average about $200 to $225.

Weekend reports covered the conference of officials of several U. S. government agencies in Washington about the matter.

The Export-Import Division of the OPS is working with industry advisers and importers on the problems involved, and regulation should be "finalized" this week. —E. P. N.

TABLE I
January Paper Production

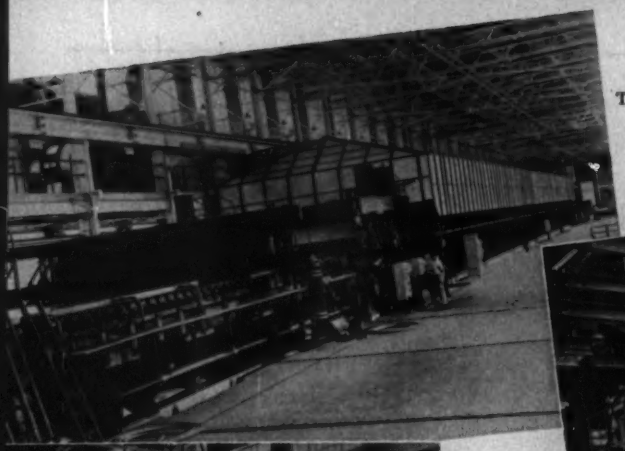
	Production Tons	% Changes in Daily Production: Jan. 1951 Compared with Dec. 1950	% Changes in Daily Production: Jan. 1951 Compared with Jan. 1950
A. Printing Papers	309,000	— 1.0	+12.4
B. Fine Papers	107,000	— 4.6	+10.1
C. Coarse Papers	311,000	+ 2.5	+ 8.6
D. Tissue Papers	123,000	— 0.7	+ 8.8
E. Miscellaneous Papers	42,000	— 1.7	+22.8
F. Total, Groups A-E	892,000	— 0.5	+10.7

January, 1951 had two more working days than December, 1950 and one more day than January, 1950.

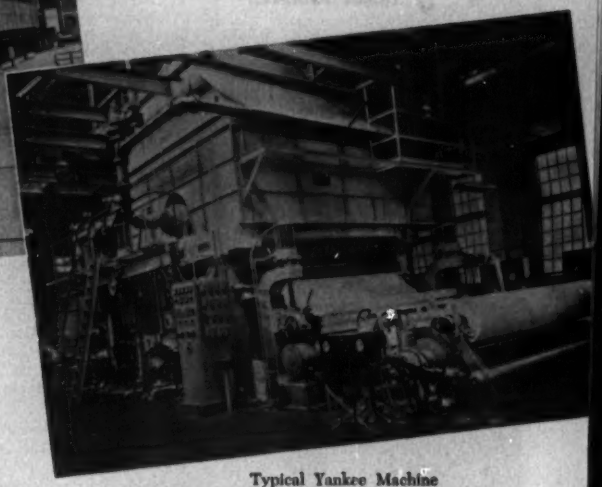
Paperboard Production (Tons)*

	Mar. 3 1951	Feb. 24 1951	Mar. 4 1950	Month of Feb.
Production	245,830	251,715	195,488	977,946
New Orders	345,004	201,026	249,548	987,609
Unfilled Orders	750,562	663,339	371,009	750,562

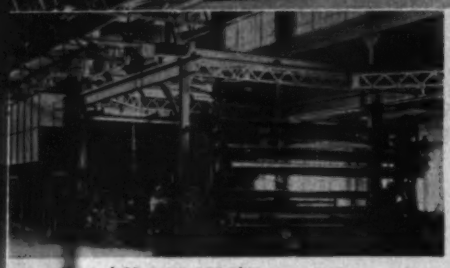
* Source: NPA.



Typical Liner Board Machine



Typical Yankee Machine



Typical Newsprint Machine

Typical Cylinder Machine

Typical Bag Paper Machine

FULL PRODUCTION at Puseyjones

Take a trip through the busy shops at Puseyjones. See the new machines under construction — Fourdriniers, Yankees, Cylinder machines. See the exacting efforts of engineers and craftsmen reflected in higher speeds, greater tonnage . . . each machine incorporating the benefits of over 100 years of experience in machine-building.

Under construction is a large, high-speed Fourdrinier machine for lightweight Kraft for a mill in Florida; a Fourdrinier machine for Kraft paper and liner for installation in Colombia, South America; a high-speed Fourdrinier Yankee machine for lightweight Kraft for installation in Louisiana; a large book paper machine for installation in Wisconsin, a Cylinder Specialty Machine for installation in North Carolina, and a large high-speed Fourdrinier machine for Kraft bag paper for a mill in Georgia. Several Stream-Flow Vat Systems are also under construction for board mills in Alabama and New Jersey.

Puseyjones has just delivered a Fourdrinier machine for ground-wood specialty papers to a mill in New York State, and a three-roll newsprint machine for India.

Talk over your paper-making problems with Puseyjones engineers. Get all the facts on the high-speed, quality production machines that are coming from Puseyjones. Write today.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

Paper TRADE JOURNAL

Major Expansion Program For Union Bag

Alexander Calder, president of Union Bag & Paper Corp., has announced that the board of directors had approved a major expansion program for the company's Savannah plant which will include the addition of a new paper machine and the installation of equipment for the manufacture of semi-chemical pulp through the use of gum woods.

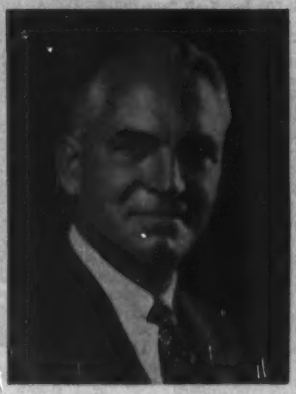
The addition of the semi-chemical pulping process to the Savannah plant's already highly integrated manufacturing and converting operation, and the installation of the sixth paper machine will increase the plant's daily production of kraft paper and kraft paperboard by approximately 400 tons and will add substantially to the number of employes on the Savannah payroll.

The semi-chemical pulp will be used in manufacturing the paperboard which is used as the corrugated, or fluted, board which goes into the manufacture of corrugated shipping containers. It is proposed to convert the semi-chemical pulp into paperboard on the plant's No. 2 paper machine which is now producing both kraft paper and kraft liner board. The new sixth machine will be used for the manufacture of kraft paper.

Work on the several projects in the broad expansion program, Mr. Calder stated, will get under way immediately and is expected to be completed during the first half of 1953. Morton C. Tuttle Co., of Boston, who have completed several expansion projects at the Savannah plant, will be the general contractors, and the engineering is being done by the plant's construction engineering department with Robert T. Inman, chief engineer, in charge.

It was pointed out that the construction of the semi-chemical pulping process plant and the installation of the new paper machine would employ approximately 600 construction workers.

The new paper machine, which will be installed in the paper machine room adjacent to the No. 5 paper machine, will be especially constructed to Union Bag's specifications and will produce a sheet of kraft paper nearly 20 feet wide. Its speed will probably exceed that of any other similar machine in the industry.



Alexander Calder

Mr. Calder stated that the manufacture of semi-chemical pulp in the Savannah plant with gum or hardwoods as the basic raw material will afford Union Bag an opportunity of making another contribution to the economy of the state. Forest landowners, he pointed out, will not only be afforded a new and steady market for their gum wood but the cause of forestry will be advanced by the removal of hardwoods which are retarding the growth of pine trees on many forest tracts, and by affording owners of timberland acreage a better balance of timberland growth and more efficient timberland management.

Mr. Calder said it was possible that the introduction of the recently developed semi-chemical pulping process into the plant's production facilities may lead to other uses of gum or hardwoods in other phases of manufacture and conversion. "We intend," he said, "to take full advantage of our expanded facilities and of the research being done by Union Bag & Paper Corp. and others in connection with the further use of trees, other than pine, in the kraft manufacturing process."

"The growth of the Savannah plant," Mr. Calder said, "has been rather phenomenal, and in looking back to 1936 when our first machine was started it is with some degree of satisfaction that we ponder the great forward strides we have made. Less than 15 years ago we employed only 600 people at a total annual wage of approximately $1 million, and today we have more than 5,000 persons on our payroll at Savannah who this year will receive wages and salaries in excess of $15 million. In addition to the employes in the plant, the wood consumption of the Savannah mill requires the full time of 4,000 persons employed in the woods by dealers from whom we purchase wood."

"In appraising the contributions made by our Savannah plant to the economy of this region, it is significant to note that products of the plant are sold in each of the 48 states and in more than 20 foreign countries. This broad market provides for a maximum of local employment, and gives us every reasonable assurance of a steady operation inasmuch as we would not be affected too greatly by adverse business conditions in any one or several community outlets."

"The average pulp and paper mill has one machine. There are some in the south which have two and one which has three, but with the completion of this new project, Savannah will have six machines. These six machines are among the nine largest in the world."

"The plant generates enough electrical energy to service a city as large as Savannah, and last year its freight bill amounted to more than $10 million. More than 60,000 cars of inbound and outbound freight were handled during 1950. This freight movement represented 36 percent of the inbound car loadings and 22 percent of the outbound car loadings in the greater Savannah area."

Mr. Calder pointed out that the plant's contribution to the economy of the state as a whole had increased proportionately with the plant's payroll. The price paid for pulpwood is now more than four times greater than it was when the Savannah plant began operations in 1936. "At that time," he said, "we were buying pulpwood for $4 a cord delivered at the plant and today we are paying $17 a cord."

The plant is now spending approximately $12 million a year for pulpwood, most of which comes from Georgia.

This annual wood bill, Mr. Calder said, will be substantially increased on completion of the installation of the semi-chemical plant and the new paper machine.

CAPITALIZATION INCREASE

BROWNVILLE, N. Y.—The capitalization of the Brownville Paper Co., which was incorporated in 1893, has been increased from $300,000 to $750,000, according to a certificate of amendment filed by the secretary of state with Jefferson County Clerk Fred H. Moore.

Heretofore the capitalization has consisted of 3,000 shares of $100 par common. Robert L. Pease is president. The company produces "Seaform" bond and other high grade papers.

MARATHON CORP. OF DEL.

DOVER, Del. — Marathon Corp. of Delaware, Inc., paper and fiber business, has filed a charter of incorporation with the Secretary of State's office. Capital of the firm was listed at 10,000 shares of stock, no par value. Corporation Trust Co., 100 West Tenth street, Wilmington, Del., is serving as the principal office.

WESTMINSTER EXPANSION

A $2 million expansion program is announced by Westminster Paper Co. Ltd., Toronto, Ont. All necessary materials for a $400,000 building addition have been obtained and contractors have work underway. An order has been placed for a paper machine of 40 to 45 tons daily capacity.

GREAT NORTHERN MODERNIZES

The Great Northern Paper Co. has under way a new program in the direction of modernization, quality improvement, additional paper output and increased power producing capacity.

A new paper machine, now being built, is scheduled for delivery to the Millinocket mill late this year. This new unit, No. 6, will be the third to be installed since 1947, and will complete the program of replacing the six older machines at the Millinocket plant. These three machines represent an increase of approximately 37,000 tons per year in the company's newsprint producing capacity.

An additional Great Northern four-foot magazine pulp grinder and two 4,000 h.p. synchronous grinder motors are also to be installed at Millinocket, followed by increased groundwood storage tank capacity. A complete new installation of groundwood screens is now in progress.

At the Madison mill, the program includes improvements to No. 1 paper machine; new wood chipping and chip screening equipment; a refiner and mixing-tank system for stock preparation, and a combination groundwood-sulphite pulp bleaching plant. These changes and additions, which should be completed late this year, will permit the production of groundwood papers of greatly improved quality at the Madison plant.

Plans also include a substantial increase in the company's power producing capacity to provide for additional production and for protection against possible future low water conditions.

Progress on all jobs is, of course, subject to the availability of materials and equipment, but it is hoped that no undue delays will be encountered.

The cost of the entire program, which will extend into 1953, is estimated at approximately $8,250,000. The company expects to be able to carry out this program, in addition to a normal maintenance and equipment schedule, without recourse to outside financing.

The Kokusaku Pulp Industry Co., Ltd., Asahikawa, Hokkaido, Japan . . . Capacity: Rayon Pulp, 65,000 Ton; Kraft Paper, 20,000 Ton; Alcohol, 1,000 Litre . . . Employees: Asahikawa Mill, 1,628; Yufutsu Mill, 498.

ELK FALLS PROGRESS

Thomas B. Hargreaves has now arrived in Campbell River, B. C., and taken over his new duties as resident manager for the Elks Falls Co., Ltd., which is building a newsprint mill at Duncan Bay nearby.

Mr. Hargreaves said actual construction would get under way before the end of March, and would require approximately 500 workers. M. MacKay, project engineer, will be in charge of construction.

Erection of a camp to accommodate the men is now in progress, and an up-to-date cafeteria to feed approximately 400 is being erected.

Mr. Hargreaves states the pulp and paper mill is scheduled for completion in the spring of 1952, and will give employment to about 200 men, with an additional 200 in logging work nearby. Machinery valued at over $5 million is already being purchased.

PULP FROM WASTE LUMBER

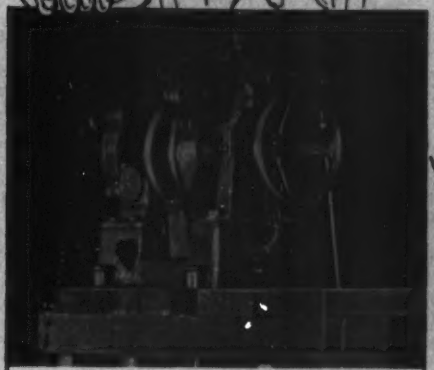
HUDSON FALLS, N. Y.—The Empire State Pulp Products, Inc., a newly incorporated organization, has acquired the former Allen branch of the Union Bag & Paper Co., according to announcement made here on February 19. The plant is surrounded completely by the properties of the corporation recently sold to the General Electric Co. The company plans to manufacture pulp from waste lumber and will sell its products to paper mills. The machinery is ordered and production is expected to be launched late in March. About 30 hands will be employed. Principal interests in the new firm are held by Nelson E. Wright, of Keene, N. H.; Juan Silva, of Havana, Cuba; A. E. McCorry, of New York City; John A. Smithlin, Keene, N. H.; Joseph D'Agostine, of New York City.

PRODUCTION AT SAO PAULO

OTTAWA—Total production of paper of all types in Brazil amounted to 216,544 tons in 1949, of which more than half was produced by the State of Sao Paulo, states a report of Foreign Trade Service, Canadian Government. During the same year imports totalled 53,440 tons, the greater part of which was newsprint. Imported cellulose amounted to 96,043 tons.

The following shows the participation of Sao Paulo in the national production:

Types	Total Brazilian Production	Per Cent Produced In Sao Paulo
Printing Papers	79,441	41.6
Writing Papers	26,353	64.3
Wrapping Papers	97,237	56.7
Others	13,513	60.5
Total	216,544	53.3



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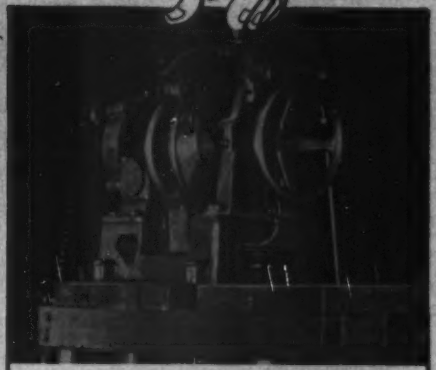

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Wood Pulp Shortage

HOLYOKE, Mass. — The wood pulp shortage is hitting some local paper manufacturers hard.

One mill, the Crocker-McElwain Co., was forced to stop its two paper-making machines all five working days last week, while the Pearl City Division of the American Tissue Mills in South Hadley Falls has stopped operations this week.

Other paper mills in this city are finding it hard to get pulp and are seeking ways of keeping their machines and men busy.

Most of the machine room and beater room workers at Crocker McElwain were laid off as a result last week. Full operations have been resumed.

M. J. Duryea, company official at American Tissue Mills, said that most of the 35 workers at Pearl City were kept on the job doing necessary repair work. He said the division had been working an extremely busy schedule since January, 1950, with shifts working Saturdays, holidays, and practically every Sunday, until the pulp shortage slowed operations.

Edward C. Reid, vice-president of American Writing Paper Corp., said that the pulp shortage had not shut down any machines or caused any layoffs there.

"All our machines in all the divisions are going five or six days a week," he declared. "All our normal contracts are being filled."

He said, however, that the company had not been able to buy any wood pulp lately and that there had been "a little slowing up in the finishing rooms —something which can happen at any time."

Philip W. Gridley, assistant treasurer at Crocker-McElwain, said the boxcar shortage was the immediate reason for his company's failing to get enough pulp to keep running last week. He said a car of pulp from Everett, Wash., was delayed and took four or five weeks to reach Holyoke.

He said there was a nationwide boxcar shortage but that there is "some evidence" more cars will be available in the future.

There is a world shortage of sulphite pulp, Gridley said. Foreign countries, often aided by Marshall Plan dollars, are bidding more on the world market for pulp than American firms, and naturally, the pulp producers are selling to the highest bidders.

He revealed one unusual case where a foreign government offered a Canadian pulp mill $400 in ECA dollars for a ton of bleached sulphite pulp for which American firms offered only the standard bid of $150.

Federal government policies in part have contributed to the shortage, he said. The U. S. recently shipped great quantities of sulphur from Texas to Europe, causing pulp mills to suffer. He added that recent floods in the Northwest country had washed out and tied up two railroads, contributing to transportation headaches.

This situation, he said, prevailed all over Holyoke in the mills. At one mill in the city, Mr. Gridley said, two machines have been put to work chewing up corrugated board in place of pulp. At another mill, which makes high grade paper, the pulp shortage caused the company to run through 100 percent rag paper for two weeks, on those lines which ordinarily had lower percentages of rag content. "It was either 100 percent rag or no paper at all with the shortage," said Mr. Gridley.

MUNISING'S PULP SHORTAGE

MUNISING, Mich. — The Munising Paper Co. is faced with a critical shortage of pulpwood for continued full-time operations, officials of the firm reported recently.

The shortage is so serious that the mill is making an urgent appeal to producers and farmers in the area to increase their shipments to the mill.

B. L. Trillich, company president, on March 8 said the next 60 days is the most critical period. After that, regular shipments from local areas are anticipated.

ASK NEWSPRINT CONTROL

OTTAWA—Canadian Government control of newsprint distribution has been requested by W. E. McCartney, managing director, on behalf of the Canadian Weekly Newspapers' Assn. in a brief presented here to Prime Minister St. Laurent and members of his Cabinet, with the Association representing 538 members who publish the home newspapers of nearly 5,000,000 Canadians.

The Association states that this step is essential, in the opinion of Canadian publishers, in order to prevent unfair allocations of Canada's newsprint. The Association, therefore, asks for a 10 percent increase in the quota of newsprint for domestic consumption and assurance that the weekly press would get their share of this increase.

Regarding newsprint supplies, the brief said that the Newsprint Association has decided to ship to the United States customers in 1951 some 65,000 tons more than in 1950, while Canadian consumers are to get no increase at all. The Association proposes a 10 percent increase in quota for the Canadian users so that this would permit the circulation of Canadian newspapers to keep pace with the expected population growth and would still leave per capita consumption far, far below that of the United States.

The Association also called upon the Canadian Government itself to reduce its consumption of paper. It noted particularly that the public relations agencies of the various departments of the Government could slash their paper needs.

KRAFT MILL FOR PORTUGAL

OTTAWA—A sulphate mill is to be established in Portugal, under the aegis of the Marshall Plan, according to a report of Foreign Trade Service, Canadian Government, from Lisbon. Of the total estimated cost of $9.6 million, approximately $4 million will be furnished by the United States. Contracts for machinery and plant equipment have already been placed, as follows: United States, $4 million; United Kingdom, $1,906,000, and Sweden and Finland, $202,000.

The mill, which will be constructed in Cacia, a district heavily timbered with pine, is expected to be in production in 1952, the report states. The annual output is to be 20,000 tons, half bleached and half unbleached. As this capacity is somewhat greater than the present consumption needs, there will probably be an exportable surplus of some 5,000 tons. The operator of the mill is Companhia-Portuguesa de Celulose.

$4 MILLION SULPHUR PLANT

OTTAWA.—Noranda Mines is planning to construct a $4 million plant for the production of sulphur and it is understood that the site being considered for the proposed plant may be Hamilton, Ont.

The new plant will treat 300 tons of pyrite a day and will produce elemental sulphur and sulphuric acid. Some 150 tons of sulphur will be produced daily, of which one-third will be elemental sulphur and the balance sulphuric acid. There will be also approximately 100 tons of sinter iron.

Noranda has ample supplies of pyrite for the new plant, with the deep No. 5 zone having 100 million tons of pyrite ore.

John L. Rankin, president of St. Lawrence Paper Mills Ltd., and Lake St. John Power & Paper Co., has been elected to the board of directors of Noranda Mines, Ltd.

HEADS LABOR CONGRESS

OTTAWA. — The Pulp, Sulphite and Paper Mills Workers' International Union has climbed to the top of the membership ladder in The Trades and Labor Congress of Canada and is now the largest international union within the Congress.

With a membership reported for January, 1951, of 33,138, they top the International Association of Machinists by nearly 7,000 members. Machinists have held the top rung in Congress for many years.

EVERY MAN RESPONSIBLE FOR GRINDING ROLLS SHOULD READ THIS PAGE

HERE'S WHAT "SWING REST" MEANS, AND HOW IT HELPS YOU IN GRINDING LONG ROLLS

The swing-rest principle of the Farrel two-wheel roll grinder is designed to eliminate the *unavoidable inaccuracies* which occur in grinding long rolls in a fixed-rest machine.

WHY INACCURACIES OCCUR

When rolls are ground with a fixed-rest machine, inaccuracies result from a number of causes, such as: (a) Distortions in the machine occasioned by changes in temperature, (b) uneven settling of the foundation, and (c) warpage of the bed, due to seasoning, which even the most careful process of stress relieving cannot prevent over a period of time.

Small vertical movements of the grinding wheels are not serious. Horizontal movements, on the other hand, will shorten or increase the distance between centers of work and wheel by exactly the same amount as the movement. The diagram shows the effect of vertical movement (as when the bed is out of level) combined with a slight horizontal movement.

HOW THE SWING REST OFFSETS THESE INACCURACIES

The Farrel grinder has a saddle "A" (see cross section drawing), which is swung by links "C" on knife edges "E" and "E1" from brackets supported on carriage "B". On this saddle are mounted the grinding wheels "D".

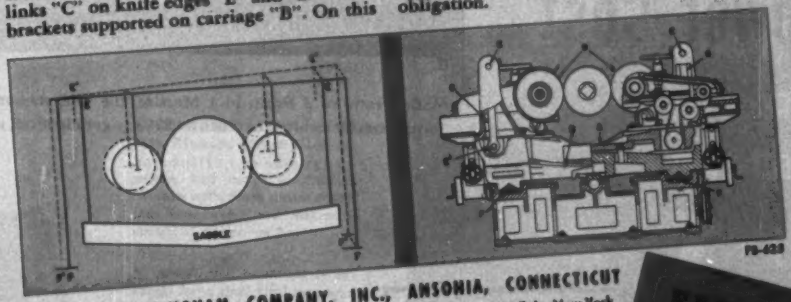
Any movement of the carriage "B" imparted by inaccuracies in the ways "F" will cause a corresponding movement of the saddle supports "E". If the grinder were operated as a fixed-rest machine, this would also cause an equal sidewise movement of the grinding wheels and would result in an inaccurately ground roll.

The swing-rest principle prevents the wheels from following fully the sidewise movement of the carriage. The force of gravity operating on the pendulum formed by the links "C" and the saddle "A" retards the movement of the saddle in relation to the carriage. This results in the elimination of the unavoidable inaccuracies which occur in a fixed-rest machine.

The swing-rest principle provides the operator with a machine which, when accurately set, grinds rolls to the proper straightness and uniformity of curvature, and to exact roundness.

WHERE YOU CAN GET MORE INFORMATION

The swing-rest principle, as well as the patented crowning device and other features of the Farrel two-wheel roll grinder, is described in detail in a new bulletin, No. 118. Send for your copy today. No cost or obligation.



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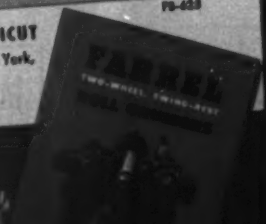

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How would you like to report to your management savings of over $1 per ton of paper... or board?

How would you like to cut your sizing costs one-third?

You can make these savings... *now*... with Monsanto's Mersize.
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Monsanto will be happy to arrange for a mill trial to prove how MERSIZE can produce better sizing at lower cost IN YOUR PLANT.

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SHORTAGE

WASHINGTON, D. C.—Military needs since the Korean war started are putting extra pressure on an already near-capacity demand for paper forms, industry spokesmen last week advised the National Production Authority.

As their products are classed as operating supplies, virtually every order they will receive under NPA Reg. 4 will carry a DO rating, they pointed out, which will interfere with filling of other defense-rated orders.

The recently-authorized "MRO" order is expected to further complicate this situation, so that NPA has informed the industry it will take immediate steps to relieve producers of business forms from the large number of rated orders which may be placed on it as a result of this authorization. Consideration is being given to an action patterned after the NPA paper order M-36, which will provide that a fixed percentage of forms produced be set aside to fill defense-rated DO orders.

Advisory committee representatives reported to NPA that facilities for forms production are being expanded even beyond the 1950 level when 186,000 tons of paper were used. This figure was 35 percent above the consumption of 1946. However, industry members point out that they are handicapped by a shortage of skilled manpower for manufacturing such items as sales books, paper lithograph plates, register supplies, teletype paper rolls, targets for military use, and paper supplies for office machines.

M. R. O. PROGRAM

A program to maintain at peak efficiency the Nation's existing equipment for the production of goods and services has been announced by Manly Fleischmann, Administrator of the National Production Authority, U. S. Department of Commerce.

"Under this program," Mr. Fleischmann said, "all establishments in the United States — warehouses, factories, retail and wholesale stores, service shops, farms, hospitals, schools, libraries, churches, Federal, State and local governmental agencies — may, when necessary, use a priority rating to procure equipment and supplies for maintenance, repair and operation of their present facilities.

"Many business and industrial firms, educational, health, welfare and public service institutions are at present having great difficulty in obtaining the materials and equipment necessary to continue in full operation at a time when more and more materials are being used to build new facilities.

"We cannot let the need for materials and equipment to build new facilities interfere with the maintenance of existing capacity. We can afford a few pounds of metal today to keep a machine running rather than several tons tomorrow to make a replacement machine. And this way we avoid the loss of production and employment that would result if we allowed our present equipment to fall into disrepair.

"It is essential that the Nation's present production and service facilities be kept in good repair so that they can operate at the maximum rate consistent with direct defense requirements. The purpose of today's action is to make this possible. It is vital that we maintain a strong civilian economy while we go ahead with the job of rearmament. It is believed that the MRO program will not interfere in any manner with the defense program because the materials required constitute a small percentage of the total supply."

The MRO program is provided for in a regulation issued February 27 (NPA Regulation 4). The regulation is permissive in character. No one is required to use the ratings assigned to purchase his MRO supplies but if he does so he becomes bound by the limitations of the regulation.

The regulation permits application of the rating, identified as DO-97, by business concerns and other institutions without individual authorization by NPA. The rating may be used solely to acquire maintenance, repair and operating supplies and may not be used to purchase production material (i.e. material or components to be incorporated in end products) nor to purchase major capital items. The rating is equal to all other DO ratings and is fully extendible. Ratings are applied in accordance with the provisions of NPA Regulation 2.

If a concern elects to use a DO-97 rating even on a single occasion, it must then limit its MRO purchases in accordance with Regulation 4.

Under the regulation, MRO purchases are limited in any one calendar quarter to one-fourth of the firm's dollar purchases for maintenance, repair and operating purposes in 1950 (or the fiscal year ending nearest to December 31, 1950). If this quota is too small to provide sufficient MRO supplies, the firm may file with NPA an application for an increased quota.

To provide for seasonal businesses, the new regulation permits quarterly MRO quotas equal to the amount spent by the business for MRO in the corresponding quarter of 1950 (or fiscal year).

Businesses which were in operation only a part of 1950 are permitted a quota in proportion to the amount they spent for MRO while they were in operation, with reasonable adjustments for seasonal and other variable factors. New firms started after December 31, 1950, are permitted to acquire for MRO purposes the minimum amounts necessary for operation, up to $5,000 a quarter. They must obtain special NPA authorization for MRO expenditures above this amount. When the quarterly quotas for these businesses exceed $1,000, the NPA must be informed in writing of the base period used, the reasons for selecting it, and what adjustments have been made.

Small businesses are permitted to extend DO-97 ratings for MRO purchases up to $1,000 a quarter, without regard to the quota restrictions. All other firms making MRO purchases under DO-97 ratings are required to follow the procedures established in the regulation for figuring their quotas.

In all cases where DO-97 ratings are used to procure MRO supplies, the firm is required to charge against its MRO quota purchases made without use of the rating.

To provide for the orderly transition to the MRO program, NPA also issued a direction (Direction 1 to Reg. 4) governing MRO procurement during the remainder of the first quarter of 1951.

During the remainder of the first quarter of 1951, businesses may take one-half of their quarterly quota, disregarding their MRO purchases prior to February 27. If they need greater quantities for filling DO-rated orders already on hand, an application for an increased quota may be filed. It may be considered approved, unless the NPA advises to the contrary, and one-half of the increased quota may be used prior to April 1.

The DO-97 priority rating may be applied to non-rated MRO orders now outstanding. Any orders so rated prior to March 15 shall take effect as of March 15. New DO-97 orders placed prior to March 15 shall also carry the March 15 effective date, but rated MRO orders placed on or after March 15 shall take effect as of the date the rating is applied.

This action replaces the amendment to NPA Reg. 2, issued January 11, which permitted manufacturers working on defense orders to procure under ratings jigs, dies, tools and fixtures where necessary to meet delivery dates established in rated orders.

Supplements to this regulation will be issued from time to time, NPA said, making further provisions for MRO materials for industries such as mining, transportation and others, which because of the nature of their operations require special handling of items for maintenance, repair and operations.

Further information may be obtained from U. S. Department of Commerce field offices.

CLUNAN JOINS NPA

AKRON, Ohio—A. B. Clunan of the Pliofilm sales department of the Goodyear Tire & Rubber Co. has been granted a leave of absence to accept a post with the National Production Authority at Washington.

Interesting Facts about Paper

The word "stationery" comes down from the Middle Ages when most people were unable to read and write. Monks set up *stations* in churchyards where they wrote and read for their parishioners. In time, paper and other things were sold, and when this became a trade its practitioners were known as "stationers." England's copyright office is still known as "Stationers Hall."

Quinozol Blue BP Dustless is a bright Acid Blue possessing excellent solubility, light fastness and level dyeing properties. It is the blue which is most extensively used in the production of blues and greens for bond and cover stock where a minimum of two-sidedness and good light fastness is desired.

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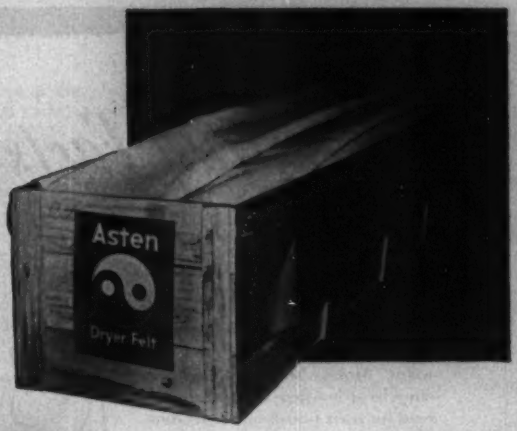

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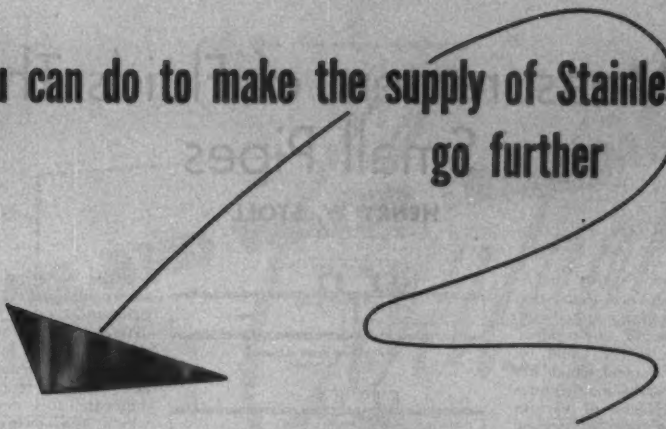

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Flow Measurement of Fluids Through Small Pipes

HENRY W. STOLL[1]

In the manufacture of paper and its allied products it has been found that flow measurements and associated control contribute to better end-product. Particularly evident is the trend toward a type of flow control which has as its basic objective the maintenance of a predetermined blend of various components such as ratio of ground wood pulp to sulphite pulp. This ratio control must be effective over a fairly wide range of flow and this is no unusual problem from a flow controller standpoint. On the other hand, to accomplish the actual metering, certain techniques should be followed. This paper will emphasize the considerations which should be given to the measurement of small flows since this category involves the most complex phase of flow metering.

Differential pressure produced for various flow rates is generally explained using the constant energy concept as laid down by Bernoulli. In briefest form, the equation can show the constancy of the potential and kinetic energies.

$$\frac{mv_1^2}{2} + mgh_1 = \frac{mv_2^2}{2} + mgh_2 \qquad (1)$$

Rearranging equation 1 to read:

$$\frac{mv_2^2}{2} - \frac{mv_1^2}{2} = mgh_1 - mgh_2 \qquad (2)$$

which says that the change in kinetic energy equals the change in potential energy. As is obvious, equation 2 is ideal and when written in final form, a coefficient applicable to a given primary element is included so as to reduce the theoretical to the actual. Calibration checks and field experience has quite clearly proven the justification of using predetermined constants for primary elements in 2 inch pipe and larger. However, flow metering in pipes of sizes less than 2 inches presents increased difficulties, particularly in determining the accuracy that is present. This is largely due to the relative higher percent effect which internal surfaces, design characteristics, dimension tolerances and the like exert on the flow-differential pressure relationship.

Treating this pipe and primary element influence on the energy equation 2 as a multiplier whose magnitude is

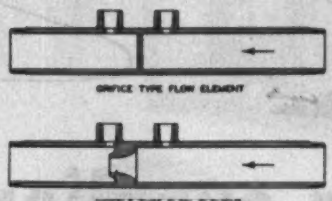

Figure 1. Two basic types of flow elements employed in flow measurements

a function of the throat velocity or of the upstream velocity, to the kinetic energy difference, equation 2 can be rewritten

$$\frac{mv_2^{\frac{1}{n}}}{2} - \frac{mv_1^{\frac{1}{n}}}{2} = mgh_1 - mgh_2 \qquad (3)$$

where n is a number whose inverse is the velocity exponent peculiar to the flow element. Reducing equation 3 to a more useable form (see appendix for complete derivation) and further, combining the velocity of approach factor with the overall flow element's constant, we obtain

$$w(\text{lbs/sec}) = KD_2^2 h^n \rho_1^{1-n} \qquad (4)$$

where K is the overall constant (primary element's coefficient included); D_2 is throat diameter in inches; h = observed differential in inches water and ρ_1 = fluid density (lbs. per cubic foot) at flow temperature and pressure. Experience to date has shown that including D_2 as a separate variable is not justified, for often it is practically impossible to provide a true representative value because of the small dimensions involved. Therefore, D_2^2 is included in the evaluation of K when the equation is written in its final form. The compressibility factor must be included, however, as an additional multiplier to KD_2^2 when the flowing material is a gas. Its evaluation is found as described in the ASME publication titled, "Fluid Meters, Their Theory and Application" on page 65, paragraph 186. When the compressibility factor is used, equation 4 becomes

$$w(\text{lbs/sec}) = KYD_2^2 h^n \rho_1^{1-n} \qquad (4a)$$

In the discussion which follows, equation 4 will only be used, and if the material metered is a gas it will be assumed that the reader will replace the term KD_2^2 with KYD_2^2.

The determination of K and n for a given metering element such as is shown in *Figure 1* is obtained through calibration runs. Initially the throat diameter D_2 is found on the basis of the square root law relating flow and velocity. The element is then fabricated and prepared for test. In order to duplicate the degree of turbulence which the element will experience when placed in service, the same Reynolds number range is used in the calibrating operation. The test fluid employed is either water or air depending on the Reynolds number, maximum flow, and resulting differential range.

Expressing equation 4 in logarithmic form

$$\log w = \log KD_2^2 + n \log h + (1-n) \log \rho_1 \qquad (4b)$$

we see that a straight line will result if w and h are plotted on log-log paper provided, of course, that KD_2^2 and upstream density ρ_1, remain constant. In liquid flow, ρ_1 presents no problem, however, in gaseous flow, the upstream density ρ_1, must be kept constant by means of precise absolute pressure control. The slope of this line is the exponent n, and it is found after the plotting is completed. Two points which are exactly on the curve are selected and n determined from the equation

$$n = \frac{\log w_2 - \log w_1}{\log h_2 - \log h_1} \qquad (4c)$$

where w_2 and h_2 and w_1 and h_1 are the two pairs of values describing the two selected points. If no points are available from the curve, they can be chosen at random preferably in sections widely separated and where good readability is obtainable. KD_2^2 is then

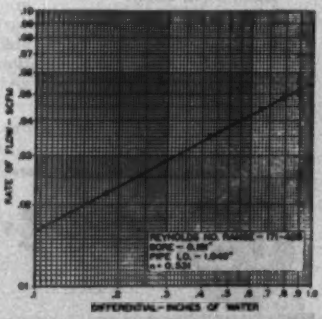

Figure 2. Typical calibration curve

[1] Application Engineering Dept., Taylor Instrument Co., Rochester 1, N. Y.

Fig. 1—Flow sheet—Paper manufacture

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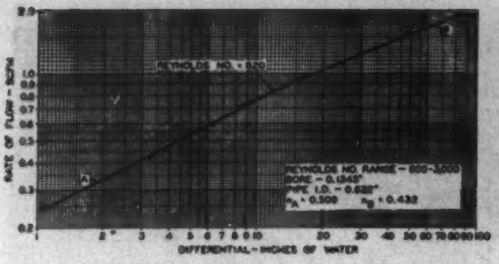


Figure 3

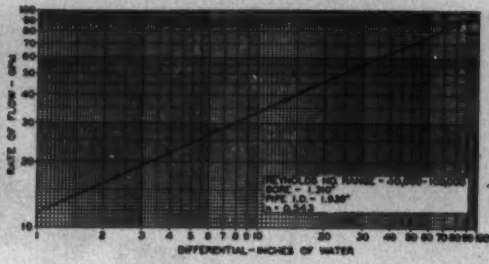


Figure 4.

found simply by substituting the value determining any one point on the line in equation 4. Referring to *Figure 4*, the slope of the line is .4575 and KD_2^2 is 10.3.

The factors KD_2^2 and n apply exactly as found if used in equation 4. The values h and ρ_1, are then the differential pressure and upstream density respectively of the actual line fluid and w subsequently calculated is the pounds per second flowing. As is apparent, w in lbs/sec. can be replaced by volumetric equivalents which merely reflects in a re-expression of KD_2^2. The author has found that equation 4 as written is a good basic starting point and that conversion into volumetric flow rate should be done only after equation 4 is completely established. Curves can then be plotted showing flow rate versus differential produced.

Typical calibration curves are shown in *Figures 2, 3, and 4*. Note the absolute adherence to straight line characteristics. The sudden change in slope shown on *Figure 3* appears occasionally and generally occurs in the Reynolds Number Range 700-900. The transition from streamline or viscous flow to turbulent flow does not serve as an explanation since the differential produced depends mainly on the velocity change occuring when the fluid enters the throat. Instead, we attribute this slope change as well as the attendant change in KD_2^2 to a "breaking" point where the viscous damping forces no longer can exercise their influence on the velocity pattern of the flowing molecules. The difficulty is totally overcome simply by rearrangement of pipe size and differential range. As is evident from these curves, flow measurement can be successfully accomplished over widely varying Reynolds Number Ranges and starting at Reynolds No. 171.

Correction Factors for use with Flowmeters Equipped with Square Root Charts or Scales

With the change in exponent of the differential from .5 to any number n, corrections must be applied to settings involving flow ratio and flow integration. As mentioned earlier, calibration curves can be furnished showing flow versus differential pressure. If a square root chart (hereafter symbolized as $\sqrt{\text{Chart}}$) or scale is used on the flow meter, then the flow equation applicable has the well known form.

$$w = K_1 D_2^2 \sqrt{h\rho_1} \qquad (5)$$

If now we read flow as measured in a small primary element, the equation, as previously recorded is

$$w = KD_2^2 h^n \rho_1^{1-n} \qquad (4)$$

Assuming a constant upstream density, and letting W_{max} equal flow at maximum square root chart position, we obtain the equation (see appendix for derivation) showing the relationship between actual flow and chart reading.

$$w = w_{max}\left[\frac{\sqrt{\text{Chart Reading}}}{\max\sqrt{\text{Chart Reading}}}\right]^{2n} \qquad (6)$$

In the event the medium is compressible and the line pressure is variable, then, as is evident from equation 4, a density correction must also be included. This is accomplished through the addition of a pressure pen calibrated in absolute pressure units (e.g. lbs./sq. in. absolute) since pressure and density can be treated as in direct proportion assuming a constant temperature. If now this absolute upstream pressure R_p and the differential pressure pen R_d are both read on the square root section of the chart, the flow at any instant becomes

$$w = w_{max}\left[\frac{R_d^n R_p^{1-n}}{\max\sqrt{\text{Chart Reading}}}\right]^2 \qquad (7)$$

where W_{max} corresponds to the flow when both the differential pressure pen and the static pressure are at the maximum position on the square root section of the chart. *Figure 5* shows the correction to be applied to the flow meter multiplier based on the use of a square root chart for values of n=.40; .45; .50; .55; and .60 in the event that the flow is being measured on a square root chart.

Flow Integration using Calibrated Flow Elements

Flow integration is accomplished on the basis of the square root law of flow and differential. For small primary elements which deviate from this square root law, flow totalization cannot be accurately accomplished except through design modification or if flow control is available. The error can be minimized by first determining an average flow rate found either by chart inspection or by calculating from the integrator reading and time interval. Second, find the corresponding chart position and obtain the multiplier from *Figure 5* which then should be applied to the integrator total for the interval involved. It will, of course, be necessary to know the "n" for the calibrated section and this is available from the data included on the calibration curve. If the flows are highly variable, then neither the flow integrator nor the square root planimeter will prove of much value if "n" deviates from the value of 0.50.

Ratio Flow Measurement using One or Two Calibrated Flow Elements

The term "ratio flow control" means that one flow is controlled so as to be an exact fraction of another flow. Letting w_1 be the variable flow, w_2 the controlled flow and R the flow ratio

$$w_2 = Rw_1 \qquad (8)$$

Assume that two calibrated flow elements are used, each having the flow equation

$$w_1 = K_1\theta_1^{n_1} \qquad (9a)$$

$$w_2 = K_2\theta_2^{n_2} \qquad (9b)$$

where θ_1 and θ_2 are pen travel expressed as fractions of total chart travel. The flow ratio controller itself actually maintains ratio control of the

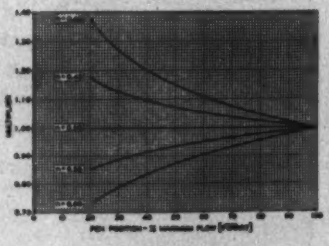
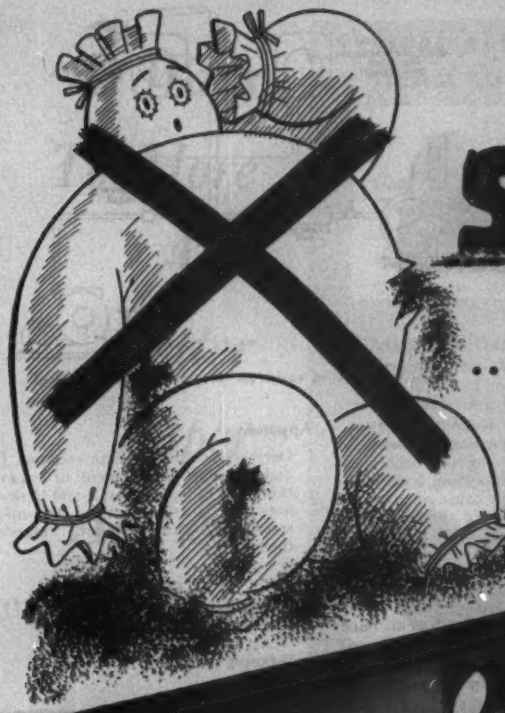


Figure 5.



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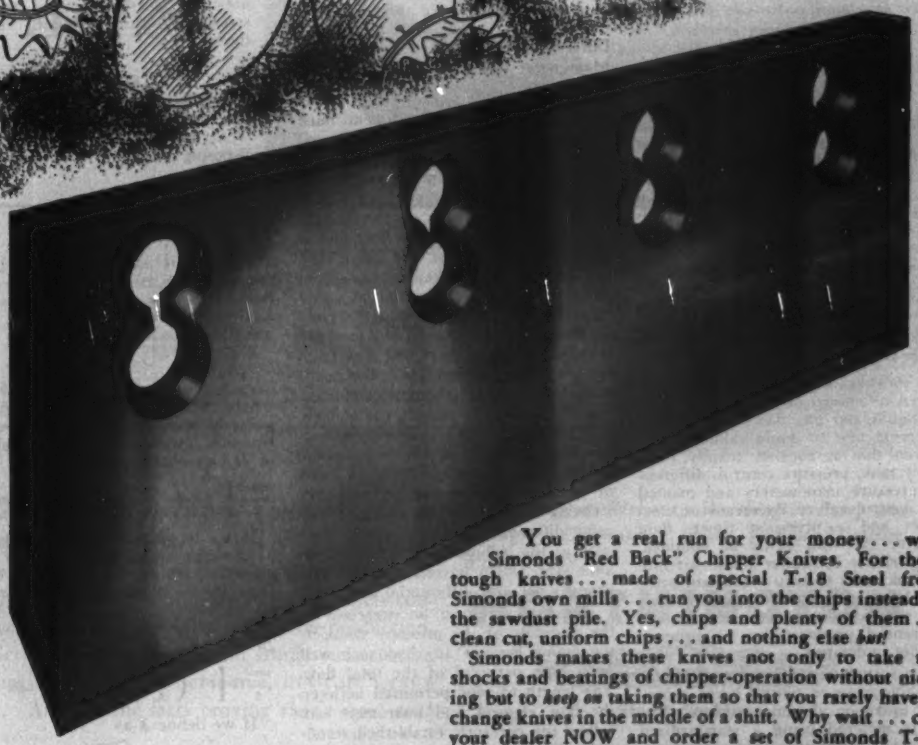

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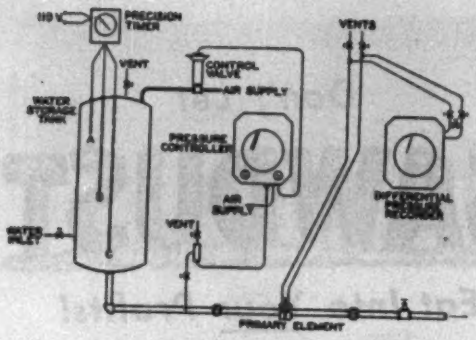

Figure 6. Calibrating equipment using water as flowing material

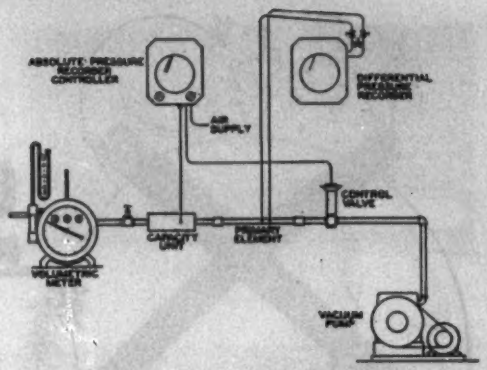

Figure 7. Calibrating equipment using gas as flowing material

two differential pressure pens h_1 and h_2 so that

$$\theta_2 = r\theta_1 \qquad (10)$$

Dividing equation 9-b by 9-a and eliminating θ_2 by substituting $r\theta_1$ as shown in equation 10, we obtain for the flow ratio R

$$R = \frac{K_2}{K_1} r^{n_2 - n_1} \theta_1^{n_2 - n_1} \qquad (11)$$

Equation 11 clearly shows that the flow ratio cannot be held constant over the flow range since the primary flow pen position θ_1 appears in this equation. Ratio flow control has proven successful, however, since the variations in θ_1 are relatively small and furthermore data accumulated to date limits the maximum value of $n_2 - n_1$ to 0.20. If $n_2 = n_1$ then flow ratio is a constant over the entire control range.

Primary Flow Element Calibrating Equipment

Calibration equipment can be arranged as shown on Figures 6 and 7 for liquid and gas flows respectively. Referring first to liquid calibration, it is seen that it consists mainly of a supply tank, pressure control, differential pressure manometers and manual flow control valve. By means of electrodes and a precision timer, fluid transfer rate can easily be obtained. The pressure controller admits air into the tank so as to keep a constant pressure drop across the flow control valve. The standard manometer records the differential produced by the primary element under test.

In a system designed for gas calibration, the pressure control keeps a constant upstream absolute pressure. The gas is metered using a standardized volumetric meter and a precision timer. The vacuum pump is shown because this arrangement is generally used only when low Reynolds Number flows are encountered. The mass rate transfer (e.g. lbs./minute) is relatively small but by reducing the upstream pressure, the differential pressure is increased. This is evident from equation 4. Leaving the flow rate expressed in lbs./second constant, any decrease in density would cause a proportional increase in differential. Since pressure and density are in direct proportion, a decrease in line pressure will cause an increase in differential pressure produced.

Differential Pressure Manometer Requirements

Basic operating characteristics of the differential pressure instrument must be considered when using small primary elements in fluid flow measurement. Reference is made specifically to the volume change per unit differential change feature of the instrument. For example, if the flow rate is changing at a rate of one cubic inch per second, which causes the flowmeter to shift its pen position at a rate requiring one cubic inch per second (bellows compression or mercury transfer), then no fluid will flow from the metering section until the manometer positioning is almost completed. To overcome this problem, particularly where flow control is required, orifices can be included in the manometer piping so as to greatly reduce its speed of response. This need of such restricting orifices can be minimized by using differential pressure instruments such as the bellows type or force balance type which have low volumetric changes per unit differential change.

Unusual care must be exercised in the assembly of the pressure connecting piping because any leak may well be a high per cent of the total flow. The length of pipe permitted between the flow element and instrument can follow the currently established standards of practice.

Purge systems are not recommended because it is quite possible to introduce considerable error in the flow measurement. The minimum effective rate of purge in many instances may be an appreciable fraction of the metered flow which would then cause the flowmeter to read an exaggerated flow rate.

Appendix

I. Derivations starting with equation 1 and showing development of equation 4. The subscripts 1 and 2 denote the measurements at the upstream and throat sections respectively.

$$\frac{mv_1^2}{2} + mgh_1 = \frac{mv_2^2}{2} + mgh_2 \qquad (1)$$

transposing:

$$\frac{mv_2^2}{2} - \frac{mv_1^2}{2} = mgh_1 - mgh_2 \qquad (2)$$

Velocity is expressed in feet per second and h is expressed in feet of fluid in the line. The quantity passing any given point at a specified time must be constant, therefore

$$v_2 A_2 = v_1 A_1 \qquad (2a)$$

where A_2 and A_1 are cross-sectional areas in square feet. Replacing v_1^2 in equation 2, with its equivalent as shown in 2a, we obtain

$$\frac{mv_2^2}{2}\left[1 - \left(\frac{A_2}{A_1}\right)^2\right] = mgh_1 - mgh_2 \qquad (2b)$$

If we let ϕ represent the influence of the pipe and primary element as a multiplier whose magnitude is a function of the throat velocity (or upstream velocity since both are in direct proportion), we can rewrite equation 2b

$$\frac{mv_2^2}{2}\phi\left[1 - \left(\frac{A_2}{A_1}\right)^2\right] = mgh_1 - mgh_2 \qquad (2c)$$

If we define ϕ as

$$\phi = v_2^{\frac{1-2n}{n}} \frac{\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right]}{\left[1 - \left(\frac{A_2}{A_1}\right)^2\right]} \qquad (2d)$$

Equation 2c now becomes

$$\frac{mv_2^{\frac{1}{n}}}{2}\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right] = mgh_1 - mgh_2 \qquad (2e)$$

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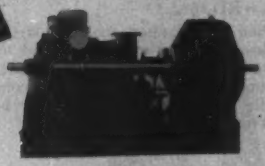

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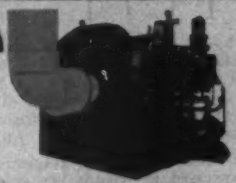

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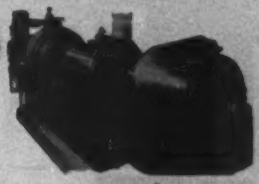

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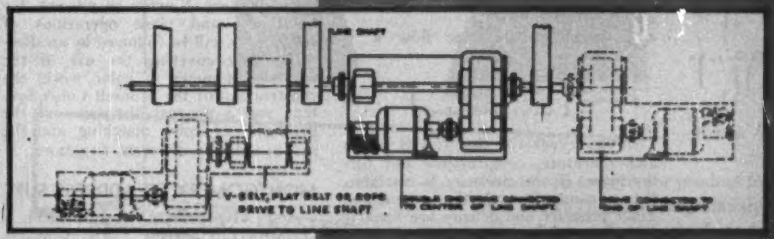

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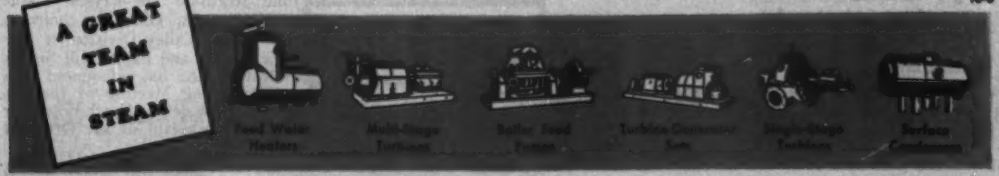

Equation 3 in the text is similar to equation 2e except that the velocity of approach factor is replaced by the actual velocities and then simplified to read

$$\frac{mv_2^{\frac{1}{n}}}{2} - \frac{mv_1^{\frac{1}{n}}}{2} = mgh_1 - mgh_2 \qquad (3)$$

Simplifying equation 2e further, we have

$$v_2 = \frac{2[g(h_1 - h_2)]^n}{\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right]^n} \qquad (3a)$$

Since $h_1 - h_2$ is the height difference of the column of fluid supported in the upstream and throat sections, it can be replaced by an equivalent height difference of water, using the quation

$$h_w \rho_w = h \rho_1 \qquad (3b)$$

where ρ equals density of respective fluids expressed in pounds per cubic foot and h the feet of fluid. Furthermore volume flow Q expressed in cubic feet per second is equal to velocity times area. Equation 3a can now be revised to read

$$Q = \frac{2A_2}{\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right]^n} \left[\frac{g \Delta h_w \rho_w}{\rho_1}\right]^n \qquad (3c)$$

Replacing Q by its exact equivalent w/ρ_1 where w is lbs./sec. of material flowing, we obtain

$$w(\text{lbs/sec}) = \frac{2A_2\rho_1}{\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right]^n} \left[\frac{g \Delta h_w \rho_w}{\rho_1}\right]^n \qquad (3d)$$

Replacing A_2 with $\frac{1}{4}\pi D_2^2$ and defining

$$B = \frac{2g^n \rho_w^n \pi}{4} \qquad (3e)$$

Equation 3d reads

$$w = \frac{BD_2^2}{\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right]^n} h^n \rho_1^{1-n} \qquad (3f)$$

Note that the Δ has been dropped from the term Δh because hereafter h is defined simply as inches water differential pressure. Equation 3f is ideal in that it infers a perfect transition from kinetic to potential energy and since in practice this is not true, the equation is accordingly corrected to include a coefficient C. Letting K be an overall constant, we have

$$K = \frac{BC}{\left[1 - \left(\frac{A_2}{A_1}\right)^{\frac{1}{n}}\right]^n} \qquad (3g)$$

Substituting equation 3g in 3f

$$w(\text{lbs./sec.}) = KD_2^2 h^n \rho_1^{1-n} \qquad (4)$$

II. Correction factors for use with flowmeters equipped with Square Root Charts or Scales.

If a flowmeter is equipped with a square root chart, the flow equation

$$w_o = K_1 D_2^2 \sqrt{h_1 \rho_1} \qquad (5)$$

is generally expected to apply. If the true equation for flow is

$$w = KD_2^2 h^n \rho_1^{1-n} \qquad (5a)$$

then a correction to the instrument's flow multiplier must be applied for the various pen positions on the chart. Assuming that the fluid is non-compressible, equations 5 and 4 can be rewritten

$$w_o = w_{max} \sqrt{\frac{h}{h_{max}}} \qquad (5b)$$

$$w = w_{max} \left(\frac{h}{h_{max}}\right)^n \qquad (5c)$$

Solving for $\frac{h}{h_{max}}$ using equation 5-b and then substituting in equation 5-c, we obtain

$$w = w_{max} \left[\frac{w_o}{w_{max}}\right]^{2n} \qquad (5d)$$

The ratio $\frac{w_o}{w_{max}}$ is exactly equivalent to

$$\frac{\sqrt{\text{Chart Reading}}}{\sqrt{\text{Chart Reading}_{max}}}$$

and therefore, the true flow w is

$$w = w_{max} \left[\frac{\sqrt{\text{Chart Reading}}}{\sqrt{\text{Chart Reading}_{max}}}\right]^{2n} \qquad (6)$$

In the event the material is a gas and, therefore, compressible and furthermore, if the pressure is variable, then ρ_1 cannot be treated as a constant. Since pressure and density are linearly related, assuming, of course, a constant temperature, P_1 in psia can replace ρ_1 and the constant K modified accordingly. Equation 4 then becomes

$$w = K' D_2^2 h^n P_1^{1-n} \qquad (6a)$$

Letting R_d correspond to differential pen reading on the square root chart and R_p correspond to the absolute pressure reading on the square root chart and R_e equal maximum square root chart reading (e.g. $R_e = 25$ on a 0.25 square root chart) then equation 6-a becomes

$$w = K' D_2^2 \left[\left(\frac{R_d}{R_e}\right)^2 h_{max}\right]^n \left[\left(\frac{R_p}{R_e}\right)^2 P_{1max}\right]^{1-n} \qquad (6b)$$

$w = w_{max}$ when $R_d = R_e$ and $R_p = R_e$. Making this substitution

$$w_{max} = K' D_2^2 h^n_{max} P_1^{1-n}{}_{max} \qquad (6c)$$

Dividing equation 6-b by 6-c, we get

$$w = w_{max} \frac{R_d^{2n} R_p^{2-2n}}{R_e^2} \qquad (7)$$

ASSOCIATIONS

PENJERDEL MEETING

Plans for the May 11-12, 1951 meeting of the Pennsylvania-New Jersey-Delaware Division, to be held at Hotel Easton, Easton, are being rapidly completed. The program will follow the pattern so successfully used during the past several years by the group. The idea behind these programs is to have speakers who will deliver messages of vital importance to paper mill supervisors and executives.

One of the speakers for the May 11-12 meeting is to be John Todd of the Hartford Insurance Co. who is to present a paper that will treat of hazards and electrical equipment maintenance in paper mills.

The affiliates are already at work on a breakfast program that presages to be bigger and better than anything ever put on by the group before.

OHIO TAPPI MEETING

The April Meeting of the Ohio Section of TAPPI will be held at the Hotel Manchester in Middletown, Ohio on April 10. Dinner will be at 6:45 P.M. and the program will follow at 7:30 P.M. George Welp of International Printing Ink Co. will be the speaker for the evening. He will show a color movie illustrating use and measurement of color from Gutenberg through Isaac Newton to present day laboratory and plant operations of I.P.I. This will be followed by an illustrated talk covering the use of the spectrophotometer in color work, the construction of the Munsell Color System, and a general discussion of the principles of color matching and the use of color in different situations.

MONTGOMERY TO ADDRESS SUPT

A. E. Montgomery, vice-president, J. O. Ross Engineering Corp., Chicago, Ill., is to address the Miami Valley Division of The American Pulp and Paper Mills Superintendents Assn. on the evening of March 22, at the Manchester Hotel, Middletown, Ohio. His subject is "Hoods and Hood Exhaust."

Mr. Montgomery, in presenting his subject, will discuss the features of a properly designed hood for various types of machines — including Yankee and vertical stack machines. He also will discuss the economics of proper and improper hood exhaust, as well as means of recovering heat and the economy involved in so doing.

MIAMI VALLEY SPRING MEET

John Murdsall, The Crystal Tissue Co., Middletown, Ohio, as chairman of the Miami Valley Division of The American Pulp and Paper Mill Superintendents Assn., has announced that the 1951 Spring Meeting of the Division has been definitely scheduled for May 25 at the plant of the Orr Felt

(Continued on page 32)

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Suction Rolls—Their Uses and Maintenance*

C. M. Connor[1]
Romeo Tourangeau[2]

The first suction rolls to be used successfully in the paper industry of the United States made their appearance during the early part of the present century. Since that time, there have been many advances in their design; their efficiency has been increased; and the number of uses to which they have been put has been extended.

The early installations, over quite a period of time, were limited to the couch, replacing the time-honored straight couch with felt-covered top roll. The suction first press was the next application to be developed. Then, gradually, down through the years, came other uses; so that today, without attempting to list all uses, there are suction drum rolls, drum presses, cylinder couches, pick-up and transfer rolls, extractors, and felt conditioners. Also, according to rumor, at least one tissue mill is using a suction breast roll.

Machinery manufacturers are considering not only their own researches in applications but also the ideas that we — the industry as a whole — are tossing about in our dreams. Just a case in point, for example why can't the suction roll manufacturers make a roll that will keep dryer felts free of fuzz, line and foreign material—a sort of continuous vacuum, so to speak, that would overcome the disadvantages of the stationary suction box or the slotted pipe. Of course, there is the possibility of paper winding around the roll during a break; but that's the problem of the roll manufacturer, or is it? Maybe we should help.

It will be interesting to follow future developments in suction roll applications; but, for the moment, let us as operators consider the care required to keep suction rolls—precision-made and important parts of paper mill equipment—operating at highest efficiency.

Perforated rolls with internal suction boxes have been used for a sufficiently long period to prove that such rolls, with reasonable care, will give many years of good service. Some of the earlier model rolls are still operating in quite a few mills in this country.

Suction rolls, however, do not operate without their troubles. Some operators have had some rather sad experiences with them.

We will try to outline some of the more common troubles; list their symptoms; and, as far as possible, give preventive measures.

PLUGGING OF PERFORATIONS

First, let us take the suction couch. Is there anything more exasperating than to find a streaky appearance in your sheet that you eventually trace to a hard incrustation lining the perforations of the roll, leaving the perforation more oblong than round. Your everyday trips by the roll when in motion, and the limited views of it you get because of the wire, probably has lulled you into the feeling that the holes are full-sized or as big as saucers. Therefore, unless you have taken necessary preventive measures, it may be later than you think—the drainage area of the roll may have been reduced considerably.

After doing everything you can to treat your water and adjust your chemical furnish to minimize this build-up, the best possible precaution is to "blow" the roll immediately after each shut-down with your high-pressure wash hose. This practice removes any accumulation before it has time to harden.

Another preventive measure is to spend at least twenty minutes at each wire change, in flushing out the roll with the highest pressure water source available. Low volume high-pressure water pumps, with guns provided, available from several manufacturers, are excellent for this purpose.

Such pumps develop pressures as high as 1000 psi. Even when the holes have been neglected to the point where the accumulations or fillings are semi-hard, these high-pressure machines will blast them out.

Allowing a roll to rotate in a detergent bath usually will soften accumulations to a point where they may be flushed out with a pressure hose. This procedure, however, is slow; also care has to be exercised in selecting a detergent that will not affect bearing seals, especially if the seals are of the felt type.

This same cleaning operation is being performed successfully in many mills through the use of steam-detergent guns.

In extreme cases, the holes of a roll may have to be drilled or punched out —a long and expensive procedure when you consider the thousands of holes involved.

It is obvious that drilling should be avoided, not only from the cost standpoint but because hand drilling, even when carefully done, leaves burrs that invite more rapid build-ups in the future.

Several manufacturers are making pneumatic punches which are preferable to drills for this job. Although their use saves little time, they are less apt to damage holes.

GROOVED OR SCORED CYLINDERS

Another bugaboo of suction rolls is the internal grooving of the inside surface of the shells, resulting, ultimately, in loss or lessening of vacuum seal.

The first sign of this trouble in a roll that has long been in service, is a gradual decrease in vacuum. Oftentimes, the usual vacuum is evident on a start-up; but, the decrease shows up as the roll continues in service throughout the week.

In extreme cases, and only until more permanent relief can be effected, a temporary and helpful expedient is to shut-down and reverse the roll several times by hand. This manipulation dislodges the accumulation of fibre and filler between the grooves and sealing strips.

Grooving and scoring can occur in a comparatively new roll without any tell-tale drop in efficiency. To avoid such trouble, insist on the removal of sealing strips and deckles, cleaning of showers, and the flushing of suction boxes and shells at every shut-down.

The moving of the suction box alternately away from and against the shell, at least once a week, helps a great deal in preventing fibre or filler from accumulation between the seal strips and the shell. This practice also keeps the adjusting mechanism from binding.

Although the adjusting mechanism is usually of bronze and will not corrode, its parts will gum up so badly that the lever can be budged, nor can the adjusting screws of the end deckles.

Unnecessary wear of a cylinder can

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* Presented at the 1950 Fall Meeting of the Pennsylvania-New Jersey-Delaware Division of the American Pulp and Paper Mill Superintendents Assn., October 6-7, Hotel Warwick, Philadelphia, Pa.

[1] Technical Director and [2] General Superintendent, W. C. Hamilton & Sons, Miquon, Pa.

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be caused by the pressure of the suction box against the roll. If it is necessary to apply too much pressure on the box to effect a seal, it is best to investigate. Make sure that the springs under the seal strips are free and in working order.

Of course, a grooved roll can be rebored if enough shell is left to prevent sag. However, prevention of scoring is highly preferable.

As for the seal strip showers, keep them clean, use fresh water, and use the showers continuously.

The frequency of renewal of strips and deckles depends on conditions. Twice a year is not too often. In fact, a roll should be overhauled completely that often.

Rubber-covered suction press rolls add to the worries of an operator. The holes of such rolls are smaller than the holes of the non-covered roll. Also, they are more subject to becoming filled especially since the nap of the press felt has been added to fibre and filler as a substance with which to colg holes. Here, it is more important to avoid drilling than it is in the case of a straight bronze shell since the damage can be greater.

Generally speaking, preventive measures for the suction press are the same as for the suction couch. However, in the case of rubber-covered rolls, the use of a steam-detergent gun should be avoided because of the possible danger of heat to the rubber cover and its bonding.

SLIPPED COVERS

A few operators have had rubber-covered suction rolls upon which the covering has slipped. It is fortunate that this trouble does not happen too often since it raises havoc with the efficiency of a roll.

A slipped cover may operate for a time without being noticed. Finally, however, the holes in the rugger get so far out of alignment with the holes in the bronze shell that drainage efficiency of the roll is seriously impaired.

Since the area of the drilled holes in the rubber covering of a roll is 10 percent or less of the drilled area of the shell, even with some slipping, a roll will continue to function, more or less, as a straight press. Trouble begins when the holes in a slipped cover

CAUSES OF SLIPPED COVERS

Among the causes for slipped rubber covers are the following:

1. Insufficient or faulty bonding of of rubber to shell.
2. Overloading with top press.
3. Misalignment of rolls.
4. Uneven loading of top press (causing a torque or strain).
5. Torque due to roping felts while washing.
6. Accidental injury: For example an object, such as a piece of metal, going through press and loosening the cover from shell at point of contact in going through nip.

It is amazing what rubber-covering specialists can do in repairing a gouged out spot in a roll. Knowing the composition of the rubber in a roll, they can put in patches that are hard to detect.

Proper loading of a press cannot be stressed too emphatically.

A modern roll can probably take a load up to 300 lb. per inch; but it is folly to gamble on it.

A suction press is put in to increase efficiency over the straight press. Therefore, we, as operators, are neglectful if we allow a machine tender to pile excessive weights on the levers or turn the valves on the auto-weight press when he has a comparatively new felt that will take it. Rather he should be taught to let the other presses do their share.

The need for proper alignment of rolls may seem elemental; yet, it is surprising how far press rolls can be out of alignment and still function. Misalignment, of course, applies a torque load that may cause a cover to slip.

To a lesser degree, uneven loading of a roll at either end applies a torque load with the same possible result as misalignment. When it is found necessary to weight a roll unevenly, the reason should be determined and the cause eliminated.

A dual-load recording instrument is an excellent means for checking on load pressures. Such an instrument, to be sure, must be kept in good calibration.

With the lever and weight form of loading, the weights should be spaced evenly. If it is necessary for the weights to be spaced unevenly, the cause should be determined and eliminated.

The roping of a felt — the time-honored method of washing—also can be a contributing factor in causing the rubber cover of a press roll to slip. The slipping, in such a case, would be caused by the building up of an excessive nip pressure in a limited area of the roll. A good detergent flowed onto the felt through a shower pipe installed just ahead of the nip—the vacuum pump running and the felt in normal position—makes it possible to avoid roping.

In a set-up of this kind, the vacuum pump takes a fair share of the soap through the felt; and, after a thorough rinse, the felt should be open as it would be if roped.

Probably the most important cause of suction roll trouble is faulty lubrication. It hardly seems possible that operators would overlook such an essential feature as lubrication, yet makers of suction rolls report that many of the rolls returned to them show negligence in the lubrication of the bearings.

There is little excuse for this condition since the roll manufacturers supply clear cut instructions on the care and operation of the rolls. Also, the lubricant supply engineers will gladly make proper recommendations.

Every mill superintendent should take an interest in the lubrication routine. This interest should go right down to the man who does the job. This man will appreciate the interest of the superintendent—also, the superintendent's interest will impress the oiler with the importance of his work.

There is one last comment—and, that is, when in doubt consult your machine builder. He not only has the answers, but likewise is as anxious as the operator to have trouble-free suction roll performance.

ASSOCIATIONS

(Continued from page 28)

and Blanket Co., Piqua, Ohio. A new procedure to be followed at the meeting will be the election of officers for the Division for the following year rather than waiting until the first meeting in the fall to do it.

A nominating committee—Kon Matchuk, Maxwell Paper Co., Franklin, Ohio; Harold Leighton, Beckett Paper Co., Hamilton, Ohio; and Harry Hadley, The Gardner Board & Carton Co., Middletown, Ohio—has been appointed to present a slate of officers at the meeting in Piqua.

LADIES NIGHT

The 1951 Ladies Night Dinner-Dance meeting of the Michigan Division of The American Pulp and Paper Mill Superintendents Assn., an annual affair that is the gala social event of the Division each year, is scheduled for Saturday, May 12, at Hotel Harris, Kalamazoo, Mich.

The Suppliers are sponsoring a cocktail party for one hour preceding the dinner. Dinner will be at 7:00 P.M.

Music for dancing from 10:00 P.M. to 1:00 A.M. will be furnished by Charles Schaffer's Orchestra.

L. M. Halleck, vice-president, Kalamazoo Tank and Silo Co., Kalamazoo, Mich., is to be toastmaster.

SUPTS. MAY ENJOY OPERA

The road show of the Metropolitan Opera Co. will be playing in Minneapolis on May 4-6, 1951. The spring meeting of the Northwestern Division of The American Pulp and Paper Mill Superintendents Assn., meets on May 4-5 at the Radisson Hotel in the same city.

Attendance at the opera will not conflict with the convention program other than on Saturday evening when the superintendents are to have a dinner dance; and, even in this case anyone wishing to attend the opera can take in the dinner.

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- MURIATIC ACID
- PITTCHLOR
- PACIFIC CRYSTALS
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- PERCHLORETHYLENE

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Patent Abstracts

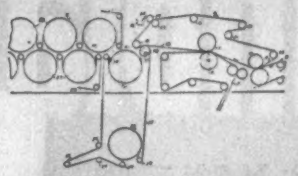
● *In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information are included.*

U.S. 2,537,017 — Coating Compositions. Gerald R. Barrett, Winchester, Mass., assignor to Monsanto Chemical Company, St. Louis, Mo. Filed May 29, 1948 — Issued January 9, 1951.

A coating composition for flexible surfaces comprising as essential film forming materials; (1) polyvinyl butyral; and (2) a copolymer consisting of the copolymerization product of a secondary alkyl half ester of an ethylene α,β-dicarboxylic acid selected from the group consisting of maleic and fumaric acids, wherein the alkyl radical contains from 6 to 10 carbon atoms, and styrene, said half ester and styrene being copolymerized in a molal ratio between 1:1 and 1:2; and a plasticizer for said film-forming materials.

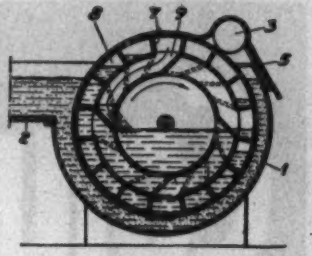
U.S. 2,537,129 — Structure for Web Transfers. John E. Goodwillie, Beloit, Wis., assignor to Beloit Iron Works, Beloit, Wis. Filed October 5, 1945— Issued January 9, 1951.

In a paper making machine including a press section, a press felt therefor, a drier section and a drier felt therefor, means for transferring a wet web of paper from said press felt to said drier felt with the wet web constantly supported upon the surface of a felt until said web reaches said drier section to thereby eliminate the necessity of stripping said web from a bare press roll surface, said means comprising a suction transfer roll having a suction area around which said drier felt is lapped, and rolls guiding said press felt with the wet web thereon to bring a length of said web supported only by said press felt into contact with said drier felt at said suction area to cause the suction effect thereof to transfer said web to said drier felt, said drier felt with the web thereon extending beyond said suction area into said drier section to transfer said web to said drier section.

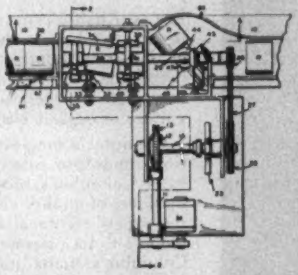


U.S. 2,537,414—Screening Drum for Dewatering Suspensions. Karl Roland Lindblad, Sundsbruk, Sweden, assignor to Svenska Cellulosa Aktiebolaget, Stockholm, Sweden, a joint-stock company of Sweden. Filed February 4, 1946 — Issued January 9, 1951.

A screening drum for draining suspensions such as fibrous suspensions and intended to rotate in one direction while being partially immersed in a body of such suspension, said screening drum including in combination an outer generally cylindrical shell provided with screening openings, an inner imperforate shell spaced from said outer shell, a plurality of longitudinal partitions between the outer and inner shells dividing the space therebetween into a plurality of cells, discharge ducts communicating between said cells and the interior of the drum, said discharge ducts being contiguous to said inner shell, bent backwards in relation to the direction of rotation of the drum and grouped at one zone of the drum into a plurality of annular sections adjacently disposed in the axial direction of the drum with a plurality of ducts to each section, and said inner shell being tapered conically in the direction of the inlet ends of said discharge ducts.



U.S. 2,537,464—Paper Roll Breaker. John A. Holmberg, Camas, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif. Filed August 31, 1948 — Issued January 9, 1951.



In a roll breaker of the character described, means for moving paper rolls through said breaker, a roll-moving element mounted for rotation on an axis and located in the path of said moving means, means for producing intermittent partial rotations of said element, a roll-engaging member mounted on said element, a pusher plate for temporarily pushing individual rolls out of alignment upon their entry into said breaker, whereby to start the breaking apart of the separate rolls, means for intermittently operating said pusher plate, and a roll-holding clamp for preventing travel of subsequent rolls in said breaker while one roll is being moved by said element.

U.S. 2,537,462 — Method of Making Automatic Bottom Bags. Alfred B. Haslacher, San Francisco, Calif. Filed November 16, 1944 — Issued January 9, 1951.

A method of making bags which comprises advancing a web of paper and removing therefrom consecutive areas spaced apart a distance corresponding to a bag length; superimposing said web of paper upon a web of heat-fusible material and tubing the superimposed webs with the heat-fusible web on the interior of the tube; severing consecutive bag lengths from said tube

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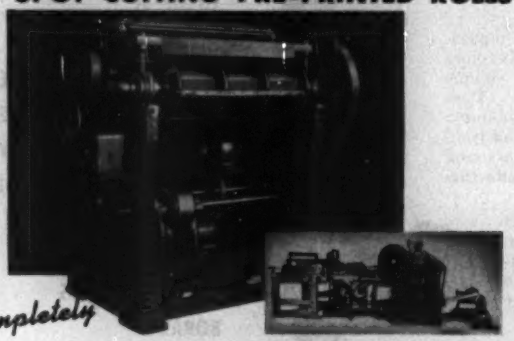

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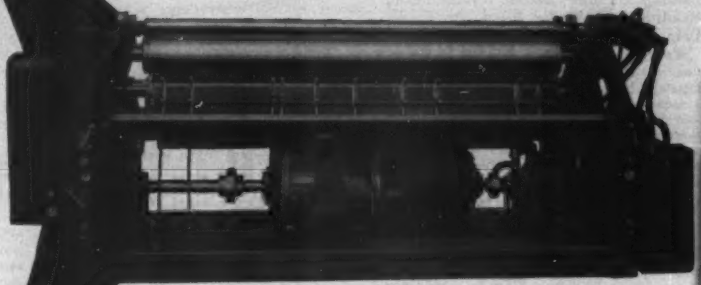

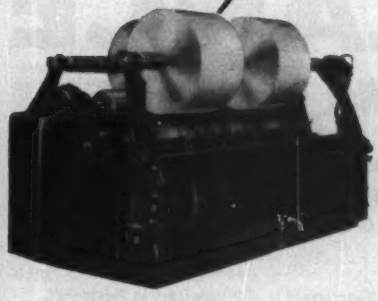

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with one of the aforesaid areas at one end of each length; forming a diamond fold at that end of each length, said diamond fold having, at its lengthwise extremities, flaps defined by pairs of slits in both plies of opposed walls of said tube; bringing the inner surface of one margin of the inner material intermediate said flaps into overlapped condition on the outer surface of the opposed margin of the inner material in the plane of the diamond fold, the aforesaid area of removal of the paper being so located as to expose the heat-fusible ply throughout the length of one such margin; and so controlling the bringing of said margins into such overlapped condition as to bring said exposed margin of said heat-fusible ply beneath the opposite margin, and then heat sealing the contacting portions of said heat-fusible ply while shielding the underside of said overlapped portions against blocking.

U.S. 2,537,499 — Web Severing Apparatus. Colin Martin Williamson, Reading, England. Filed April 23, 1945 — Issued January 9, 1951.

Web-severing apparatus comprising a guillotine, web-feeding means for forwarding a web thereto, driving gear for said web-feeding means, a web-measuring roller frictionally driven from said driving gear and frictionally engaged at all times with the web at a point beyond said web-feeding means and before said guillotine, and means for operating said guillotine and for positively arresting said measuring roller during the guillotine operation.

U.S. 2,537,509—Process for Making Wallboard. Thomas P. Camp, Arlington Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill. Filed December 20, 1944 — Issued January 9, 1951.

In the process of forming an improved recessed end wallboard, comprising the steps of inserting transversely a supporting member having the desired surface configuration under an enclosed plastic cementitious mass whereby a surface transverse ridge overlying the said supporting member is formed, applying a vibratory force to the approximate area of the said transverse ridge surface over said supporting member for a sufficient length of time to puddle the said ridge into a substantially uniform surface plane and allowing the mass to set whereby the surface configuration of the supporting member is retained by one side of the enclosed plastic mass and other is substantially plane.

U.S. 2,537,588—Web Winder. Albert William Husson, Chester, Pa., assignor to Eddystone Machinery & Mill Supplies Co., Chester, Pa. Filed August 27, 1946 — Issued January 9, 1951.

In a winding machine, a plurality of spaced parallel cooperating winding drums, a shell on which a web or the like is wound, rotating in contact with one of the drums, a knife having an inactive position below the path of the web being wound and an active position in contact with the web to cut it, a vertical cylinder, a piston in the cylinder, an operative connection between the piston and the knife to raise and lower the knife, a source of fluid pressure, a rockable fluid valve connected to the source of fluid pressure and to both ends of the cylinder, having a closed position at an intermediate angle, an open position connected to one end of the cylinder at one extreme angle, and an open position connected to the other end of the cylinder at an opposite extreme angle, with an exhaust position for each open position connected to the opposite end of the cylinder from that connected to the source of fluid pressure, manual means for rocking the valve into the extreme angular position for raising the knife, a fork cam rockably connected on the valve, and an abutment travelling up and down with the knife, intersecting one fork of the cam to rock the valve into the extreme angular position for lowering the knife as the knife moves up, and intersecting the other fork of the cam to rock the valve into the intermediate position to close the valve as the knife moves down.

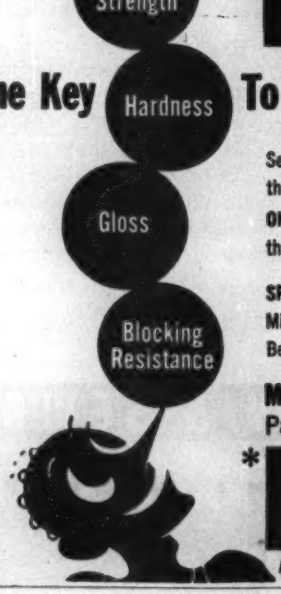
U.S. 2,537,667 — Waterproofing of Fibrous Products. Jay C. Harris, Dayton, Ohio, assignor to Monsanto Chemical Company, St. Louis, Mo. Filed August 24, 1944 — Issued January 9, 1951.

An aqueous dispersion wherein the disperse phase consists of particles having a size between the limits of 0.5 to 10.0 microns and the aqueous phase has a hydrogen ion concentration between the limits of pH = 9.0 and 10.0 comprising the following ingredients in per cent by weight:

	Percent
N,N'-distearoyldiaminomethane	3.5-15
Hydrocarbon soluble resinous dibutyl ether of tetramethylolmelamine	8.0-24
Oleic acid	3.5-8
Paraffin wax	3.5-8
Ammonium hydroxide (28%)	4.0-8
Water, balance	

U.S. 2,538,103 — Method of Separating Fatty Acids from Rosin Acids of Tall Oil. Samuel D. Koonce and Edmond S. Perry, Rochester, N.Y., assignors, by mesne assignments, to Eastman Kodak Company, Rochester, N.Y. Filed November 9, 1946 — Issued January 16, 1951.

A process of treating tall oil containing fatty acids and rosin acids which comprises converting said rosin acids to rosin acid adducts having boiling points substantially higher than said rosin acids while leaving a fatty acid fraction as such by reacting said tall oil with a dienophile at a temperature not higher than 210° C. and thereafter separating said fatty acid fraction by a distilling operation.



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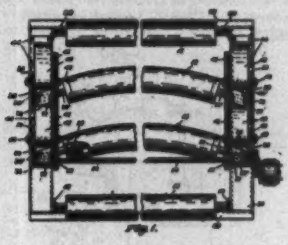
*TRADE MARK

Can. 470,452 — Bow Correcting Apparatus. John D. Robertson, Taunton, Massachusetts, U.S.A. Filed October 11, 1949 — Issued January 2, 1951.



Bow correcting apparatus comprising means at spaced locations for guiding a travelling web to and from a region of bow correction, a plurality of longitudinally curved web engaging elements extending across said region with the web engaging under one of said elements and over a next adjacent one of said elements, pivoted means supporting the opposite ends of each of said elements, and means for rotating said pivoted means of said web-engaging elements in opposite directions about their pivots thereby to move said elements from neutral positions, in which the central and edge portions of the web engaging therewith have equal travel in said region, to positions in which the central portion of the web engaging therewith has a length of path of travel in said region substantially different from the length of the path of travel it has in said neutral positions, and the edges of the web have a length of paths of travel in said region substantially different from the length of their paths of travel in said neutral position with the difference in one case an increase and in the other case a decrease.

Bow correcting apparatus comprising means at spaced locations for guiding a travelling web to and from a region of bow correction, a plurality of longitudinally curved axles extending in spaced relation across said region, a flexible roll on each said axle, each roll being rotatable about approximately the curved axis of its axle, and said web engaging under one of said rolls and over a next adjacent one of said rolls, pivoted means supporting the opposite ends of each of the axles, and means for rotating said pivoted means of said web-engaged rolls simultaneously in opposite directions about their pivots from neutral positions thereof in which all portions of the web have equal travel, thereby to increase and decrease simultaneously the length of the paths of travel of two different portions of the width of the web in said region.

Can. 470,478—Methods of Bleaching Wood Pulp. William Howard Rapson, Hawkesbury, Ontario, Canada, assignor to Canadian International Paper Company, Montreal, Quebec, Canada. Filed March 2, 1949—Issued January 2, 1951.

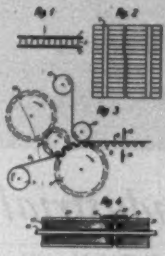
A process for bleaching cellulosic material which has been subjected to one or more pre-bleaching operations, comprising the steps of adding to said material a quantity of chlorine dioxide and thereafter adding to said material a quantity of an alkaline hypochlorite to complete the bleaching of said material.

A process for bleaching to a high brightness without substantial degradation chemical wood pulp which has been subjected to one or more pre-bleaching operations, comprising the steps of adding to said pulp a predetermined quantity of chlorine dioxide, maintaining the pH at a numerical value greater than 7, and thereafter adding to said pulp a predetermined quantity of an alkaline hypochlorite.

A process for bleaching to a high brightness without substantial degradation chemical wood pulp which has been subjected to one or more pre-bleaching operations, comprising the steps of adding to said pulp a predetermined quantity of chlorine dioxide, maintaining the pH within the range of 7 to 10, thereafter adding to said pulp a predetermined quantity of an alkaline hypochlorite, and finally washing the bleaching pulp.

In a process for bleaching chemical wood pulp to a high brightness without substantial degradation, the steps of introducing chlorine dioxide into an aqueous suspension of said pulp, permitting said chlorine dioxide to act on said pulp for a predetermined length of time, maintaining the pH within the range of 7 to 10, and thereafter adding to said suspension an alkaline hypochlorite.

Can. 470,491 — Methods in the Production of Corrugated Cardboard and Machines for Carrying Out the Methods. Peter Jacobsen, Copenhagen, Denmark, assignor to Dry Corrugating Method v/Akselbo, Berbom og Drost-



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holm, Copenhagen, Denmark. Filed August 23, 1947 — Issuer January 2, 1951. (Sec. 28A—Expires January 14, 1966.)

A machine for producing corrugated cardboard, comprising two toothed cooperating rollers, the diameters of which are so adapted that not more than three teeth on one of the rollers at any time are in cooperation with the teeth on the other roller, the said teeth having an outwards pointing protrusion running along each edge of the surface of the tooth parallel to the axis of the roller the protrusion having in a section normal to the said axis the form of a rounding with a very small diameter, said rollers having correspondingly rounded depressions in the clearances at the roots of the teeth and running parallel to the axis of the rollers.

A machine as claimed in claim 1, wherein the outer tooth surfaces are concave.

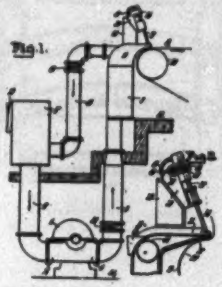
A machine for producing corrugated cardboard, comprising two toothed cooperating rollers, the diameters of which are so adapted that not more than three teeth on one of the rollers at any time are in cooperation with the teeth on the other roller, the said teeth having an outwards pointing protrusion running along each edge of the surface of the tooth parallel to the axis of the roller the protrusion having in a section normal to the said axis the form of a rounding with a very small diameter, said rollers having correspondingly rounded depressions in the clearances at the roots of the teeth and running parallel to the axis of the rollers, and at least one supply roll for supplying stabilizing strips to the corrugated core produced.

A machine for producing corrugated cardboard, comprising two toothed cooperating rollers, the diameters of which are so adapted that not more than three teeth on one of the rollers at any time are in cooperation with the teeth on the other roller, the said teeth having an outwards pointing protrusion running along each edge of the surface of the tooth parallel to the axis of the roller the protrusion having in a section normal to the said axis the form of a rounding with a very small diameter, said rollers having correspondingly rounded depressions in the clearances at the roots of the teeth and running parallel to the axis of the rollers, at least one supply roll for supplying stabilizing strips to the corrugated core produced, and a transport member sweeping the corrugated material into a pile, in a direction transversal to the direction of production.

Can. 470,537—Foam-Producing Compositions and Methods of Making the Same. Clement K. Swift, Camden, New Jersey, U.S.A., assignor to MacAndrews and Forbes Company, Camden, New Jersey, U.S.A. Filed January 28, 1947 — Issued January 2, 1951.

The method of preparing an air-foam-producing material which comprises partially hydrolyzing a substantially starch-free oil-containing corn gluten product containing at least about 70% of total protein, the major proportion of which is zein, with an alkaline earth hydroxide at an elevated temperature to form a partially hydrolyzed proteinaceous product which, when concentrated, has a viscosity corresponding to about 22 to 70 centipoises at a specific gravity of 1.13, both measurements being made at a temperature of 70° F., removing insoluble soap of the alkaline earth metal present in said solution while said solution is still hot; adding ammonium sulphate to the filtrate; boiling said solution to provide a substantially neutral product, to form an insoluble alkaline earth sulphate and to concentrate the solution; removing the precipitated alkaline earth sulphate from the solution; and adding a foam-stabilizing water-soluble salt to said concentrate either before or after the removal of the said precipitated alkaline earth sulphate.

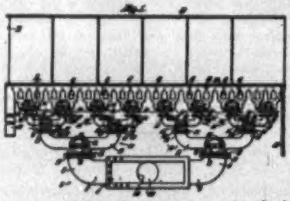
Can. 470,575—Paper Making Apparatus. Allen A. Lowe, Glens Falls, New York, U.S.A., assignor to The Sandy Hill Iron & Brass Works, Hudson Falls, New York, U.S.A. Filed September 8, 1948 — Issued January 2, 1951.



The combination in paper making apparatus of means for discharging a predetermined flow of stock onto a wire comprising, a flow box having a discharge nozzle at the upper side thereof, a collecting box for receiving stock, a pump and connections therefrom to said flow box, connections from said collecting box to said pump, and an overflow connection from said flow box and nozzle to said collecting box.

The combination in paper making apparatus of means for discharging a predetermined flow of stock onto a wire comprising, a flow box having a discharge nozzle at the upper side thereof, a collecting box for receiving stock, a pump and connections therefrom to said flow box, connections from said collecting box to said pump, and an overflow connection from said flow box and nozzle to said collecting box, and a valve in said connection from the pump to the flow box.

Can. 470,577—Paper Making Apparatus. Allen A. Lowe, Glens Falls, New York, U.S.A., assignor to The Sandy Hill Iron & Brass Works, Hudson Falls, New York, U.S.A. Filed September 8, 1948 — Issued January 2, 1951.



A paper making flow-box construction having upwardly extending passageways which terminate in a transverse row of outlets directed upwardly into a pond comprising in combination, a lower hollow section member having an inlet and hollow branches extending outwardly from opposite sides thereof and then vertically upwardly, intermediate hollow section members having lower sides connected to upper ends of said branches and provided with hollow branches extending outwardly from opposite sides thereof and then vertically upwardly, upper hollow section members having lower sides connected to upper ends of said last-named branches and having branches extending outwardly from opposite sides thereof and then vertically upwardly and terminating in transversely spaced conduits having opposite side walls which diverge relatively with the upper ends of adjacent walls of adjacent conduits secured together forming a transverse row of outlets directed upwardly, and walls forming a pond above and around said outlets.

PRICES

The prices below reflect market quotations in New York at the mill level on standard grades. Most orders accepted, however, at price prevailing on date of shipment. Does not include spot offerings.

PAPER AND BOARD

Standard News, Delivered Ports

Rolls, contract, per ton	$105.00/110.00
Sheets	118.00/ —

F.o.b. Mills. C.l. Frt. allowed, dock, N. Y.

Kraft— per cwt., 40# base wgt.

Standard Wrapping Rolls	$7.75/ —
No. 1 Wrapping Rolls	8.25/ 8.50
Standard Bag	7.50/ —

Tissues— per ream 24x36 (480) 10 lbs. 2500 lbs or more

Wh. No. 1 Frd.	‡ $1.95	/$2.25
Wh. No. MG	‡ 1.95	/ 2.25
Wh. No. 1½	‡ 1.85	/ 2.15
Wh. No. 2	‡ 1.85	/ 2.15
Kraft Non-Tar	‡ 1.85	/ 2.15
White Non-Tar	‡ 1.95	/ —

Toilet— per case of 100 rolls—1 M sheets

Unbleached 4½x4½	$8.00/$8.25
Unblenched 4½x5	6.60/ —
Bleached 4½x4½	7.10/ 8.80
Bleached 4½x5	9.85/ —
Per Case of 50 rolls—2000 sheets	
Unbleached 4½x4½	$8.00/$8.25
Bleached 4½x4½	6.95/ —
Per Case of 100 rolls—1000 sheets	
Facial, 4½x5, 2-ply	$8.95/10.65

Paper Towels—per case of 3750

Wh. Jr. M'tif'd 9¼x9½	$5.65
Br. Sr. M'tif'd 10x12	4.00
Br. Jr. M'tif'd 9¼x9¼	3.50
Br. Jr. Sgl. fold 10x10¼	3.25
Bichd. 7½x11, 24/25 rolls	$6.00/7.55

Manila, per cwt.

No. 1 Jute Tag, 100-lb., sheets*	$19.55/21.55
Reg. Jute M.F. 40-lb., sheets*	18.00/20.00
Wrapping Manila	8.75/10.50
Printing Manila	10.50/12.00

* Less usual allowance for rolls.

WORLD WOOD PULP MARKETS

First Quarter Contract Prices, Per Short Air-Dry Ton

Varying freight allowances — Atlantic Ports

	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$85.00/100.00	$85.00/100.00			
Sulphate, Bleached	135.00/200.00	175.00/ —	*180.00/187.00†		Competitive
Sulphate, Unbl. Northn.		147.50/155.00	*153.00/185.00*		
Sulphate, Unbl. Southn.					
Sulphite, Bichd. (Sftwd.)	135.00/165.00	145.00/ —	*175.00/ —	Competitive	Competitive
Sulfite, Bichd. (Hdwd.)	150.00/175.00				
Sulphite, Unbichd.	132.50/150.00	132.50/150.00	*155.00/165.00		
Sulphite, Unbl'd (Glassine)		143.00/146.50	*157.00/ —		
Soda, Bichd.	140.00/142.50	140.00/142.50			
Siderurgia, Pulping News	106.00/ —	106.00/ —			

* On dock. † Delivered.

Gummed Tape—per bdl., 500 bdls. or more

90-lb. 375 ft. GSI	‡ $7.20	/ —
60-lb. 600 ft. GSI	‡ 7.20	/ —
35-lb. 800 ft. GSI	‡ 8.28	/ —
35-lb. 500 ft. GSO	‡ 6.21	/ —

Boards, per ton—

Filled News	$107.50/ —
Plain Chip	105.00/107.50
Bichd. Mix. Ld. Chip	147.50/ —
White Pat. coated .020	170.00/ —
Kraft Liners 42 lb.	115.00/117.50
Kraft Corr. .009	122.50/126.00
Binders Boards	137.50/140.00

The following prices are representative distributors' resale prices.

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4 Cnts. per cwt.
100% Rag Ex. No. 1	$70.45/$72.10
100% Rag	62.45/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Cnts. per cwt.
100% Rag Ex. No. 1	$72.65/ —
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ —

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Cnts. per cwt.
Watermarked	$19.00/$20.50
Plain	18.05/ 19.50

Ledgers	4 Cnts. per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Book

Conversion Coated	Case per cwt.
No. 1	$23.40/$24.65
No. 2	21.90/ 23.40
No. 3	20.40/ 22.40
Machine Coated	
No. 1	$18.15/$11.40
No. 2	16.15/ 14.65
Uncoated	
No. 1 Antique (Watermarked)	$18.65/$19.15
Offset	17.40/ 19.90
A Grade E. F.	17.40/ 18.15
A Grade S. C.	18.15/ 18.65
B Grade E. F.	17.65/ —
B Grade S. C.	16.90/ 18.40

‡ Indicates a price change.

WASTE PAPER MARKET

The following quotations were gathered from major dealers in each market. They are an indication of the price range in which volume tonnage was moving on the date specified. Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) PENDING OPS ROLLBACK, THESE PRICES REPRESENT CEILING RANGE.

	New York Jan. 25	Philadelphia Jan. 25	Boston Jan. 25	Chicago Jan. 25
No. 1 Mixed Paper	$32.00/ 35.00	$32.00/ 35.00	$29.00/ 32.00	$33.00/ —
Boxboard Cuts	30.00/ 33.00	30.00/ 33.00	26.00/ —	38.00/ —
Mill Wrappers	30.00/ 35.00	30.00/ 35.00	30.00/ 36.00	35.00/ —
No. 1 News	37.00/ 41.00	33.00/ 40.00	33.00/ 36.00	38.00/ —
Over-issue News	40.00/ 45.00	40.00/ —	33.00/ 45.00	41.00/ —
Corrugated Containers	64.00/ 70.00	55.00/ 62.00	49.00/ 70.00	52.00/ —
New Corrugated Cuts	74.00/ 80.00	55.00/ 60.00	55.00/ 65.00	62.00/ —
Double Kraft Ld. Corr. Cuts	115.00/120.00	105.00/110.00	120.00/140.00	120.00/ —
100% Kraft Corr. Cuts	140.00/165.00	125.00/135.00	130.00/170.00	135.00/ —
Used Kraft Bags	85.00/ 95.00	80.00/ 85.00	85.00/116.50	65.00/ —
No. 1 Brown Kraft Paper	90.00/ 95.00	90.00/ 95.00	90.00/110.00	65.00/ —
Super Resorted Br. Kraft	100.00/105.00	100.00/105.00	100.00/125.00	90.00/ —
New Br. Kraft Env. Cuts	160.00/190.00	160.00/175.00	160.00/180.00	150.00/ —
New Br. Kraft Cuts	150.00/170.00	130.00/135.00	150.00/180.00	140.00/ —
No. 1 Grwd Shvs.	80.00/ 85.00	75.00/ 80.00	80.00/ 85.00	75.00/ —
White Newsblanks	115.00/125.00	110.00/115.00	110.00/120.00	115.00/ —
No. 1 Flyleaf Shvs.	80.00/ 85.00	90.00/ 95.00	95.00/110.00	110.00/ —
No. 1 Soft Wht. Shvs.	180.00/190.00	170.00/175.00	175.00/195.00	175.00/ —
Super Soft Wht. Shvs.	190.00/200.00	190.00/200.00	190.00/210.00	185.00/ —
Hd. Wht. Shvs.	185.00/210.00	200.00/215.00	190.00/215.00	180.00/ —
Hd. Wht. Env. Cuts	200.00/245.00	225.00/ —	200.00/235.00	190.00/ —
New Manila Env. Cuts	140.00/150.00	160.00/165.00	140.00/165.00	115.00/ —
Col. Tab Cards	110.00/120.00	115.00/120.00	95.00/150.00	100.00/ —
Manila Tab Cards	170.00/185.00	165.00/175.00	160.00/200.00	165.00/ —
No. 1 Mixed Ledger	100.00/105.00	100.00/105.00	90.00/110.00	100.00/ —
White Ledger	130.00/140.00	125.00/130.00	125.00/140.00	125.00/ —
No. 1 Book & Mag.†	55.00/ 60.00	40.00/ 45.00	40.00/ 60.00	35.00/ —
No. 1 Rep'd. Hvy. Books‡	65.00/ 70.00	50.00/ 60.00	60.00/ 75.00	55.00/ —

* Delivered. † Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood.

RAG MARKET

New Domestic Cotton Cuttings
(Prices to Dealers, F.o.b. Ship. Pt.)

ALL PRICES NOMINAL

No. 1 White Shirts	$23.00/$24.00
No. 1 Unbichd. Muslins	23.00/ 24.00
Bichd. Canton Flannels	17.00/ 18.00
No. 1 Lt. Silesias	12.00/ 13.00
No. 1 Lt. Prints	9.00/ 12.00
Wht. Bk. Blue Overalls (Bichable)	15.50/ 16.00
No. 1 Blue Overalls	7.00/ 8.00
Fancy Shirts	6.00/ 6.50
No. 1 Washables	5.50/ 6.00
Suntan Khaki Cuts	11.00/ 12.00
Mixed Khaki Cuts	9.00/ 11.00
Corduroy Cuts	4.75/ 5.25
Cottonades	7.00/ 7.30
Bichd. Underwear Cuts	nominal
Unbichd. Underwear Cuts	nominal

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

ALL PRICES NOMINAL

	Per 100 lbs.
Mixed White	$5.00/$5.50
Cotton Pants & Overalls	4.75/ 5.00
Thirds and Blues, Repacked	3.75/ 4.00
No. 1 Roofing Rags	3.00/ 3.10
No. 2 Roofing Rags	2.40/ 2.50
No. 3 & 4 Roofing Rags	2.20/ 2.30
Roofing Bagging	2.20/ 2.30

New Foreign Cotton Cuttings
(Prices to Mills, F.o.b. Dock, N.Y.)

	Per 100 lbs.
New Dark Cuttings	$4.75/$5.00
New Mixed Cuttings	4.75/ 5.25
Light Silesias	8.00/ 8.50
Light Flannelettes	7.50/ 8.00
New White Cuttings	nominal
New Unbleached Cuttings	nominal
Fancy Shirt Cuttings	6.50/ 7.50

Light Prints	6.50/ 7.50
Bleachable Khaki, No. 1	6.00/ 6.50
Unbl. Khaki, No. 1	5.00/ 5.50

Old Foreign Rags

(Prices to Mills, f.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	nominal
No. 2 White Cottons	nominal
No. 3 White Cottons	nominal
No. 4 White Cottons	nominal
Extra Light Prints	5.50/ 6.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	3.75/ 4.00
Dutch Blue Cottons	4.00/ 4.50
Linsey Garments	2.75/ 3.00
Dark Cottons, European	2.75/ 3.00
Dark Cottons, Egyptian	2.50/ 2.75
Old Shopperies	2.40/ 2.50
New Shopperies	2.50/ 2.75

Bagging

(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$8.00/$8.25
Domestic Gunny, No. 1	7.75/ 8.00
Heavy Wool Tares	7.00/ 7.50
Foreign Manila Rope	7.25/ 7.75
Domestic Manila Rope	7.00/ 7.25
Jute Strings	6.25/ 6.50
No. 1 Sisal Strings	7.25/ 7.50
Mixed Strings	nominal
Paper Mill Tares	5.25/ 5.75
No. 1 Scrap Burlap	
Foreign	6.50/ 6.75
Domestic	7.00/ 7.50
Austr. Wool Pouches	7.50/ 8.50
New Burlap Cuttings	7.50/ 8.00

MATERIALS

Aluminum, sulfate:		
coml. bags, wks. cwt.	1.65	
iron-free c.l.	3.25	
Alcohol, ethyl:		
tax free, dms. c.l. gal.	.77	/ 1.02
dsld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms. c.l. flt. alld. gal.	.44	
Casein, acid-prec.:		
dom. sh. pt. c.l. lb.	.42	/ .45
imp. ex dock lb.	.38½/	.39
Caustic soda:		
c.l. wks. solid, 76%, cwt.	3.35	
flak. & grd. 100-lb. drums	3.75	
liquid 50% tanks	2.55	
liquid 70% tanks	2.65	
China clay:		
dom. air-float. filler, c.l. wks. ton	10.50	
water-washed, lump, filler	11.00	
coating	17.60	/30.50
imported, ex whse. short ton	15.20	/28.25
Chlorine:		
single-unit tanks, works. cwt.	2.70	
multi-unit cwt.	3.20	/ 4.40
Formaldehyde:		
USP, ink. dms, c.l. wks. lb.	.0600/	.0625
l.c.l. E. wks.	.0450/	.0475
Fuel oil:		
Bunker C, No. 6 Cal. hvy tanks, refinery bbl.	1.95	/ 2.15
light bbl.	2.05	/ 2.10
Hydrogen peroxide:		
USP, 35% cbys. E. of Miss. lb.	.24½/	.25½
Lime:		
hydrated, bags, wks. Buffalo ton	13.50	
Rosin:		
B gum, drms, c.l. Savan. cwt.	8.00	
G, H, I, K cwt.	8.70	/ 8.79
FF, wood, dc. cwt.	7.30	
Rosin size:		
70%, gum & pale grds, tank cars, south, sh. pt. cwt.	6.80	/ 7.00
Salt cake:		
dom. bulk, c.l. wks. ton	17.00	
wks. frt. all. ton	30.00	/32.00
Soda ash:		
light, 58%, bags, wks.	1.50	
bulk cwt.	1.20	
Sodium silicate 40°:		
turbid, c.l. wks. cwt.	1.20	
l.c.l. wks.	1.85	/ 1.95
Sodium peroxide:		
dms. c.l. E. of Miss. lb.	.19	
l.c.l. do. lb.	.19½/	.20
Soybean, protein:		
chem. isol, wks. c.l. lb.	.26	/ —
Cinn. and Chic.		
Sulfuric acid:		
60° Be. cbys. c.l. wks. cwt.	1.75	/ —
l.c.l. wks. cwt.	2.05	/ 2.60
Sulfur:		
crude, c.l. mines, contract, long ton	21.00	/22.00
f.o.b vessels Gulf	22.50	/23.50
Export, f.o.b. Gulf	25.00	
Sulfur dioxide:		
liquid, coml. cyl. wks. lb.	.09	
multi-unit cars lb.	.0535	
Starches:		
pearl corn, bags, c.l. wks. cwt.	6.09	/ —
white dextrines, c.l. wks. cwt.	7.48	/ —
potato, Idaho, c.l. wks. cwt.	5.50	/ —
potato, Maine, c.l. wks. cwt.	5.25	/ —
tapioca, conv. dextrines cwt.	8.25	/ 8.75
medium grds. Gulf and East Coast ports	6.75	/ 7.50
low, Siam, on dock N. Y.	5.75	/ 6.00
	nominal	
Talc:		
domestic, 50-lb. sacks, c.l. wks. ton	25.00	/30.00
Titanium dioxide:		
anastase, c.l. deld., bags lb.	.21	/ .21½
l.c.l. deld. lb.	.22	/ .22½
rutile, c.l. deld. lb.	.23	/ .23½
l.c.l. deld. lb.	.24	/ .24½

N.B.: For special market conditions, see *Trends*.

This advertisement is neither an offer to sell nor a solicitation of an offer to buy any of these securities. The offering is made only by the Prospectus.

150,000 Shares

Rhinelander Paper Company

Common Stock

($5 Par Value)

Price $29.50 per Share

Copies of the Prospectus may be obtained in any state from such of the several Underwriters, including the undersigned, as may lawfully offer the securities in such state.

A. G. Becker & Co.

Incorporated

March 6, 1951

IMPORTS

IMPORTS AT NEW YORK

Week Ending March 10

Newsprint

(———), Mormacsaga, Copenhagen, 365 rolls.

Cigarette Paper

P. Lorillard Co., Heina, Havre, 150 cs.

Printing Paper

Olympic Shipping Co., G. Maersk, Rouen, 51 cs.

Winsor Newton Co., American Reporter, London, 1 cs.

Surface Coated Paper

Gevaert Co. of America, G. Maersk, Antwerp, 3 cs.

Gevaert Co. of America, American Lawyer, Antwerp, 9 cs.

Gevaert Co. of America, Black Condor, Antwerp, 6 cs.

Tissue Paper

Amacan Co., Mormacsaga, Copenhagen, 3 cs.

B. F. Drakenfeld & Co., American Reporter, London, 47 cs. (gauze carbonizing).

B. F. Drakenfeld & Co., American Forwarder, Liverpool, 27 cs. (gauze carbonizing).

Filter Paper

E. H. Sargent Co., Cali, Gothenburg, 11 cs.

H. Reeve Angel & Co., Inc., American Reporter, London, 21 cs.

Gummed Paper

B. F. Drakenfeld & Co., Queen Mary, Southampton, 75 cs.

B. F. Drakenfeld & Co., American Merchant, Liverpool, 47 cs.

Paperhangings

C. A. Haynes & Co., American Reporter, London, 69 pkgs., 84 bls.

Photo Paper

Alco Photo Supply Corp., Queen Mary, Southampton, 10 cs.

Crepe Paper

Brundage Merchandise Co., American Lawyer, Rotterdam, 27 cs.

Drawing Paper

Lansen Narve Corp., American Merchant, Havre, 4 cs.

H. Reeve Angel & Co., Inc., American Reporter, London, 1 cs.

Paper Serviettes

H. W. Robinson Co., American Reporter, London, 9 cs.

Tracing Paper

Lansen Naeve Corp., American Merchant, Havre, 12 cs.

Writing Paper

(———), Liberte, Havre, 1 cs.
R. Stone Co., Havfalk, Hamburg, 47 cs.

Wallpaper

Hudson Shipping Co., American Merchant, Havre, 63 rolls.
American Express Co., Liberte, Havre, 303 pkgs.
Intermaritime Forwarding Co., American Forwarder, Liverpool, 237 ctns.

Grease-proof Paper

Public National Bank Trust Co., Blommersdyk, Rotterdam, 89 cs.
Public National Bank Trust Co., Averdyk, Rotterdam, 89 cs.
Jay Madden Corp., Mormacsaga, Hango, 84 rolls (unbleached).

Wrapping Paper

Paper Corp. of U. S., Eucadia, Glasgow, 400 rolls.
McLaurin Jones Co., Eucadia, Glasgow, 1 roll.
Van Oppen & Co., Blommersdyk, Antwerp, 48 cs.
Southimco Mercantile Co., Averdyk, Antwerp, 18 cs.
N. N. Serper Co., Fort Amherst, Halifax, 105 rolls (kraft).
Paper Corp. of U. S., American Forwarder, Glasgow, 31 rolls.
Resolute Paper Products Co., Bullaren, Hango, 59 rolls (sulphate).
Jay Madden Corp., Bullaren, Hango, 497 rolls (sulphate), 84 rolls (sulphite).
Sandvik Steels, Inc., Bullaren, Gefle, 5 cs.

Parchment Paper

G. Lippelgoes, Black Condor, Rotterdam, 11 cs.

Paper Napkins

Freund Mayer Co., Mormacsaga, Copenhagen, 82 cs.

Baryt Paper

W. Reimerdes, American Reporter, Bremen, 134 cs.
R. Wilson Paper Corp., American Reporter, Bremen, 16 cs.

Baryta Coated Paper

Lep Transport, Inc., American Reporter, London, 75 rolls.
D. W. Hickey, American Reporter, London, 16 cs.

Miscellaneous Paper

Yardley & Co., Queen Mary, Southampton, 8 cs.
Coty, Inc., Liberte, Havre, 5 cs.
La Moiteaux, Heina, Havre, 160 rolls.

Rags, Baggings, etc.

O'Brien Products, Mormacsaga, Gdynia, 946 bls. old jute paper stock.
E. J. Keller Co., Inc., Averdyk, Antwerp, 46 bls. old bagging.
Robbins Forwarding Co., Heina, Rouen, 29 bls. rags.
Chase National Bank, Heina, Rouen, 63 bls. old overalls.
Irving Trust Co., Heina, Rouen, 78 bls. jute baggings.
(———), Heina, Rouen, 48 bls. rags.
Amicale Wool Service Co., Heina, Havre, 27 bls. rags.
E. J. Keller Co., Inc., Black Condor, Antwerp, 48 bls. old bagging.
E. Butterworth & Co., Inc., Black Condor, Antwerp, 51 bls. cuttings.
A. de Vries Trading Corp., Slovenija, Antwerp, 35 bls. scrap bagging, 51 bls. jute bagging, 120 bls. waste baggings.
(———), Slovenija, Antwerp, 82 bls. old bagging.
Midwest Waste Materials Co., Slovenija, Antwerp, 25 bls. picker waste, 30 bls. old coal bags, 43 bls. paperstock.
Railway Supply & Manufacturing Co., American Lawyer, Antwerp, 97 bls. jute waste bagging.
E. J. Keller Co., Inc., American Merchant, Rouen, 14 bls. rags.
E. J. Lang, American Reporter, London, 123 bls. old bagging.
Peerless Chemical Corp., American Reporter, London, 69 bls. rags.
Castle & Overton, Inc., American Reporter, London, 39 bls. rags.
(———), American Forwarder, Belfast, 98 bls. flaxwaste.
Darmstadt Scott & Courtney, Steel Chemist, Bombay, 175 bls. old rags.
(———), Manipur, Calcutta, 250 bls. jute rags.
National City Bank, Excalibur, Beirut, 70 bls. hessian bagging.
Star Woolen Co., Coastal Delegate, Tampico, 19 bls. rags.
Harris Goldman Co., G. Maersk, Rotterdam, 90 bls. old bagging.
D. Benedetto, G. Maersk, Rotterdam, 94 bls. old bagging.
L. Gottlieb, Havfalk, Antwerp, 81 bls. jute waste bagging.
A. de Vries Trading Corp., Havfalk, Antwerp, 49 bls. scrap bagging.
Castle & Overton, Inc., Havfalk, Rotterdam, 36 bls. rags.
Amicale Wool Service Co., Rio de la Plata, Buenos Aires, 134 bls. rags.

Old Rope

National City Bank, G. Maersk, Rotterdam, 55 coils.

Woodpulp

(———), Mormacsaga, Copenhagen, 293 bls. woodpulp.

Type RCV Vacuum Pump in north-central paper mill. Capacity 2826 cfm at 15" Hg.

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High volumetric efficiencies—accurately maintained clearances, effectively sealed by water, insure high efficiencies; air being handled can be dry, or contain vapors or liquids.

Low friction losses—due to no contact between impellers or impellers and casings.

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Pulp Sales Corp., Pankakoski, Kotka, 460 bls. prime bleached sulphite pulp, 570 bls. prime unbleached strong sulphite pulp, 1325 bls. prime unbleached sulphite pulp, 295 bls. prime unbleached strong sulphate pulp.

National City Bank, Pankakoski, Rauma, 6225 bls. prime bleached strong sulphite pulp, 635 bls. prime extra strong bleached sulphite pulp, 120 bls. prime unbleached strong sulphite pulp, 160 bls. prime extra strong unbleached sulphite pulp.

Castle & Overton, Inc., Cali, Gothenburg, 504 bls. woodpulp.

Gottesman & Co., Inc., Idefjord, Trondheim, 600 bls. easy bleaching sulphite pulp.

Gottesman & Co., Inc., Mathilda Thorden, Stockholm, 6,000 bls. easy bleaching sulphite pulp.

Woodpulp Boards

Jay Madden Corp., Mormacsaga, Hango, 294 rolls.

Jay Madden Corp., Stegeholm, Abo, 173 rolls.

Casein

Borden Co. Chemical Division, Bowrio, Buenos Aires, 1000 bags (ground).

Hercules Powder Co., Rio de la Plata, Buenos Aires, 1000 bags.

East Asiatic Co., Rio de la Plata, Buenos Aires, 1500 bags.

Tupman Thurlow Co., Rio de la Plata, Buenos Aires, 500 bags.

Borden Co. Chemical Division, Heina, Havre, 50 bags.

American British Chemical Supplies, Havfalk, Rotterdam, 2000 bags.

Marks & Coyle, City of Edinburgh, Wellington, 400 bags.

IMPORTS AT NEWARK

Week Ending March 10

Madden Reeve Angel & Co., Inc., Stegeholm, Abo, 364 rolls newsprint.

Pulp Sales Corp., Stegeholm, Abo, 137 rolls paper waste, 260 bls. sulphate pulp, 6303 bls. sulphite pulp.

Elof Hansson, Inc., Stegeholm, Stockholm, 7598 bls. prime white dry woodpulp.

IMPORTS AT PHILADELPHIA

Week Ending March 10

J. P. Fleissig, Heina, Rouen, 67 bls. rags.

(———), Mormasaga, Copenhagen, 44 bls. rags.

J. P. Fleissig, G. Maersk, Rouen, 41 bls. old rags.

Pulp Sales Corp., Bullaren, Hango, 391 bls. insulating board.

Elof Hansson, Inc., Bullaren, Hango, 311 bls. insulating board.

Plywood & Door Manufacturing Co., Bullaren, Hango, 793 pkgs. fiberboard.

Jay Madden Corp., Bullaren, Hango, 753 rolls sulphate wrapping paper.

Pulp Sales Corp., Bullaren, Hango, 1524 bls. dry mechanically ground woodpulp.

Madden Reeve Angel & Co., Inc., Bullaren, Hango, 351 rolls newsprint.

Jay Madden Corp., Mormacsaga, Hango, 1913 pkgs. paper tape.

(———), Mormacsaga, Copenhagen, 314 rolls newsprint.

Madden Reeve Angel & Co., Inc., Mormacsaga, Hango, 338 rolls newsprint.

Jay Madden Corp., Mormacsaga, Hango, 148 rolls wrapping paper.

(———), American Forwarder, Glasgow, 74 bls. paperstock, 62 bls. cotton cuttings.

Corn Exchange Bank Trust Co., Havfalk, Antwerp, 91 bls. bagging.

E. J. Keller Co., Inc., Havfalk, Antwerp, 66 bls. rags.

IMPORTS AT BOSTON

Week Ending March 10

Irving Trust Co., American Merchant, Rouen, 70 bls. old strings.

Swift & Sons, Averdyk, Antwerp, 36 cs. wrapping paper.

American Cyanamid Co., Mormacyork, Buenos Aires, 300 bags casein.

IMPORTS AT BALTIMORE

Week Ending March 10

Jay Madden Corp., Mormacsaga, Hango, 537 rolls woodpulp boards.

(———), Heina, Rouen, 369 rolls newsprint.

Jay Madden Corp., Bullaren, Hango, 162 rolls sulphate wrapping paper.

Pulp Sales Corp., Bullaren, Hango, 508 bls. mechanically ground woodpulp.

Gottesman & Co., Inc., Bullaren, Stockholm, 254 bls. woodpulp.

Pagel Horton & Co., Inc., Bullaren, Gefle, 1000 bls. dry sulphite pulp.

Gottesman & Co., Inc., Krageholm, Gothenburg, 508 bls. unbleached kraft pulp.

IMPORTS AT NEW ORLEANS

Week Ending March 10

(———), Steel Chemist, Calcutta, 292 bls. old cloth.

IMPORTS AT NORFOLK

Week Ending March 10

National City Bank, Black Condor, Antwerp, 125 bls. jute waste.

E. J. Keller Co., Inc., Black Condor, Antwerp, 71 bls. jute waste bagging.

(———), Black Condor, Antwerp, 234 bls. jute waste.

R. J. Reynolds Tobacco Co., Heina, Havre, 243 cs. cigarette paper.

F. P. Gaskell Co., American Forwarder, Glasgow, 20 cs. cigarette paper tips.

National City Bank, American Forwarder, Glasgow, 108 bls. paperstock.

Castle & Overton, Inc., Steel Chemist, Bombay, 70 bls. old jute rags.

(———), Steel Chemist, Bombay, 190 bls. old jute rags.

Textile & Paper Supply Co., Steel Chemist, Bombay, 100 bls. old jute rags.

Darmstadt Scott & Courtney, Steel Chemist, Bombay, 50 bls. jute rags.

(———), Havfalk, Antwerp, 63 bls. fustians.

A. de Vries Trading Corp., Havfalk, Antwerp, 82 bls. bagging.

D. Benedetto, Havfalk, Rotterdam, 65 bls. rags, 106 bls. waste bagging.

Castle & Overton, Inc., Havfalk, Rotterdam, 56 bls. bagging.

IMPORT CLASSIFICATIONS

Two sheets of high grade paper laminated with aluminum foil, known as typostat paper, reportedly developed as a substitute for metal lithographic printing plates, are under investigation to determine the proper duty classification, according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry.

The question whether paperboard made of bagasse can properly be classified as straw board is also under study.

Five shipments of Finnish wrapping paper are claimed by the importer to have been properly valued, and not dutiable at the higher value fixed by Customs officials, in cases filed in the United States Customs Court. Creped tissue paper napkins imported from Norway are claimed by the importer to be dutiable as paper cut into shapes at 15 percent and not as manufactures of paper at 35 percent, as held by customs officials.

The United States Customs Court has ruled that filter discs imported from France are dutiable at 5 cents per pound and 15 percent as filter paper, and not dutiable as paper cut into shapes because the circles are moulded in that shape when manufactured and are not cut into discs from larger sheets of filter paper.

Financial News

STOCK REPORT

	Per Share Earnings		Indic Annual Divid. Rate	Mar. 14 Approx. Market Price
PREFERRED STOCKS	Calendar Year 1949	12 Mo. to Approx. 12/31/50		
Armstrong Cork Co. $3.75 Cum.	$40.95*	$48.80*	$3.75	$110½
Armstrong Cork Co. $4.00 Cum. Conv.	40.95*	48.80*	4.00	114⅜
Celotex Corp. 5% Cum.	6.80e	11.70e	1.00	17⅜
Champion Paper & Fibre $4.50 Cum.	60.09f	103.62	4.50	102
Container Corp. of Amer. 4% Cum.	89.52	123.64	4.00	104½
Crown-Zellerbach $4.20 Cum.	54.36c	67.60h	4.20	104⅛
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.93	16.31	2.50	52⅜
Flintkote Co. $4.00 Cum.	62.70	90.41	4.00	103
Robert Gair Co., Inc., 6% Cum.	13.79†	21.28†	1.20	19½
International Paper Co. $4.00 Cum.	224.55	323.40i	4.00	107¼
Kimberly Clark Corp. 4% Cum.	85.27	114.95h	4.50	107⅞
MacAndrews & Forbes 6% Cum.	61.59	63.03i	6.00	140¼
Mead Corp. 4¼% Cum.	51.37	88.30i	4.25	98¾
Mead Corp., 2% Cum. Conv. 2nd	21.35*	36.26*i	2.00	61½
Pabco Products, Inc., 4% Cum. Conv.	56.46	120.13	4.00	101
Rayonier, Inc., $2 Cum.	9.54	17.25	2.00	36⅞
St. Regis Paper Co. 4.40% 1st A	30.74	65.23	4.40	93
Scott Paper Co. $3.40 Cum.	51.15*	65.41*	3.40	100¾
Scott Paper Co. $4.00 Cum.	51.15*	65.41*	4.00	105½
Sutherland Paper 4½% Conv.	46.92	81.31	4.25	118
U. S. Gypsum Co. 7% Cum.	283.37	348.48	7.00	180½
United Wallpaper Inc., 4% Cum. Conv.	2.14	0.84	2.00	26½
West Virginia Pulp & Paper 4½% Cum.	61.28e	99.36h	4.50	109¾
COMMON STOCKS				
APW Products Co.	(d)0.81	0.45i	—	7⅛
American Writing Paper Corp.	.84	2.82	0.50	9¾
Armstrong Cork Co.	6.37	8.13	3.75	53¾
Celotex Corp.	1.65c	3.03e	1.00	17⅜
Certain-Teed Prods. Corp.	2.84	3.92	1.50	16¾
Champion Paper & Fibre	5.15f	9.44	2.45	52⅜
Congoleum Nairn Co.	3.04	3.29	2.00	25⅛
Container Corp. of America	4.23	5.87	2.50	35
Crown-Zellerbach	6.03e	7.34h	2.20	51
Dixie Cup Co.	7.44	12.18	1.50	51⅞
Eastern Corp.	0.64	4.30	1.00	21
Flintkote Co.	4.33	5.83	3.00	30⅜
Robert Gair Co., Inc.	2.11†	3.37†	0.70	12¾
Great Northern Paper Co.	4.87	4.33	3.00	49⅜
International Paper Co.	7.12	8.65i	2.50	50⅜
Johns-Manville Corp.	4.83	7.22	3.50	54⅛
Kimberly Clark Corp.	5.29	6.28h	1.80	43⅛
MacAndrews & Forbes Co.	3.64	3.74i	3.00	39
Marathon Corp.	3.29e	5.40h	1.40	43¾
Mead Corp.	4.10	7.32i	2.20	25¼
National Container Corp.	0.95	2.00i	0.75	12½
Pabco Products, Inc.	0.83	1.87	0.60	20
Rayonier, Inc.	4.75	9.61	2.50	50⅜
Ruberoid Co.	7.93	9.64	3.18	57⅞
St. Regis Paper Co.	0.91	2.10	0.60	13
Scott Paper Co.	3.04	3.90	2.00	44⅛
Sutherland Paper Co.	4.62	7.66	2.75	45⅛
Union Bag & Paper Corp.	5.01	7.23	3.00	41¼
United Board & Carton	(d)1.61b	1.56g	0.50	18⅞
U. S. Gypsum Co.	13.51	16.70	10.00	115
United Wallpaper	(d)0.01	(d)0.01	—	3¼
West Virginia Pulp & Paper	8.58c	13.73h	5.00	76⅛

(b) Year ended 11/13/49
(c) Year ended 1/31/50
(d) Deficit
(e) 12 months to 10/31/50
(f) 9 months to 12/31/49
(g) 12 months to 11/11/50
(h) 12 months to 1/31/51
(i) 12 months to 9/30/50
(*) Earnings per combined preferred shares
(†) Includes domestic and Canadian subsidiaries and 60% equity in Southern Paperboard Corp.

British Columbia Forest Products Ltd., has declared a dividend of 10c payable May 1 to stockholders of record March 30.

Minnesota and Ontario Paper Co. has declared a dividend of 50 cents, payable April 25 to stockholders of record March 30.

St. Lawrence Corp., Ltd. has declared a dividend of 50c on first cumulative convertible redeemable preferred stock and another dividend of 18¾ cents on second cumulative redeemable preferred stock, both payable April 25 to stockholders of record on April 3.

St. Lawrence Paper Mills Co., Ltd. has declared a dividend of $1.50 on outstanding first cumulative redeemable pedferred stock and another dividend of 60c on second cumulative redeemable preferred stock, both payable April 25 to stockholders of record April 3.

Great Lakes Paper Co., Ltd., has declared a dividend of 60 cents on common and another dividend of 62½ cents on preferred stock, both payable March 31 to stockholders of record March 15.

Southern Advance Bag & Paper Co. has declared an extra dividend of 12½ cents and a regular quarterly dividend of 25 cents on the common stock, both payable March 3 to stock of record March 16. The only extra last year was 25 cents in December.

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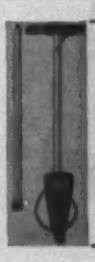
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SURFACE PYROMETER
The extension model provides temperature determination of even inaccessible rolls, quick and easy.
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CORROSION NOW POSES A DOUBLE THREAT

Worn out and corroded equipment may not be replaceable

Don't take chances on vital equipment. Scarce metals and materials are becoming scarcer. Farsighted business men are rebuilding, repairing and *protecting* to insure continuity of their operations.

Do these two things today:

1. Check up in your plant—manufacturing equipment, piping, valves, tanks, motors, and all similar items.
2. Arrange to protect them with Amercoat—the corrosion-resistant coatings; each designed to meet specialized conditions.

Note: Most conventional coatings fail under severe service conditions. They are neither designed nor suitable for such applications.

AMERCOAT CORPORATION

A Division of

American Pipe and Construction Co.

4809 Firestone Blvd., South Gate, Calif.

1-51a

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Feb. 3	Feb. 10	Feb. 17	Feb. 24	Mar. 3
1951	100.3	98.2	102.2	102.5r	102.7
	Feb. 4	**Feb. 11**	**Feb. 18**	**Feb. 25**	**Mar. 4**
1950	95.4	96.3	95.0	95.9	95.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	92.6	95.6	96.7	95.4	96.4	97.7	85.3	99.6	96.1	101.2‡	100.3‡	93.7‡	95.8‡
1951	99.5‡	101.5‡											

‡ Preliminary.
r Revised.

COMPARATIVE YEARLY SUMMARIES

	1944	1945	1946	1947	1948	1949	1950	1951
Year to Date	88.4	87.7	96.9	104.7	100.7	93.6	100.1	100.5
Year Average	88.1	89.4	100.1	104.3	96.2	88.6	92.9‡	

PAPERBOARD OPERATING RATIOS†

	Feb. 3	Feb. 10	Feb. 17	Feb. 24	Mar. 3
1951	103	104	105	105	105
	Feb. 4	**Feb. 11**	**Feb. 18**	**Feb. 25**	**Mar. 4**
1950	91	93	92	90	88

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	88	92	91	92	91	94	83	100	96	102	101	95	94
1951	102	105											

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: The chart shows the ratio through December 1950 on the basis of 6-day capacity. Beginning with January 1951 the ratio is shown on the new basis of normal 6- and 7-day capacities. Corresponding weekly and monthly ratios for 1950 on the new basis, shown in the tables above, are somewhat lower.

Paperboard operating ratios continue on the basis of a 6-day week.

† Per cents of operation based on "inch-hours" reported to the National Paperboard Association.

Pipe Dreams?

SPRINGFIELD, Mass. — Power-conscious paper manufacturers throughout the Connecticut Valley this week balanced precariously on the horns of a dilemma, trying to determine what the exact potentialities are for further hydroelectric development on the river, with resulting savings to their businesses through cheaper power purchases.

Source of the confusion came from the President's Water Resources Policy Commission, which declared that the potentialities of the Connecticut River Basin—New England's chief source of water power—should be fully developed if the area is to keep pace with industrial expansion elsewhere.

Immediately, officials of the Western Massachusetts Electric Co. dismissed the report on the river's power potential as "the same old government pipe dream."

Here's how the situation shaped up:

The government commission declared that coordination of the potential power of the Connecticut—and that of other New England streams—with the St. Lawrence River "would provide an efficient and mutually advantageous initial step toward the full integration of hydroelectric power in the northeastern region."

According to the commission's findings, New England's rivers have a potential 3,200,000 kilowatts in power flowing in them, waiting only to be fully developed. The Connecticut River basin alone, the commission said, could provide 950,000 kilowatts more.

The committee conceded that an all-purpose development of the region's water resources — for power, navigation, flood and pollution control, recreation, and the like — would present terrific problems. On the other hand, it envisioned in such a major undertaking the possibility for further economic expansion, greater prosperity and better living for all concerned.

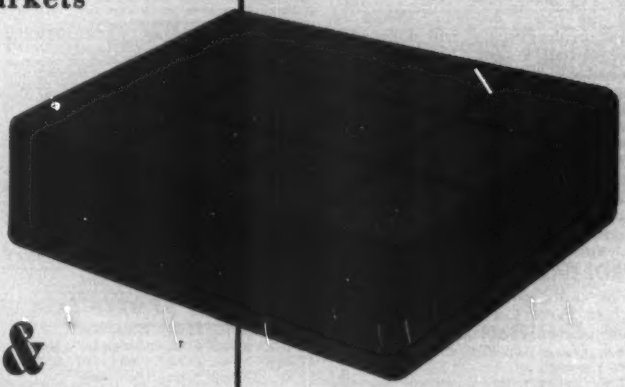
The committee's detailed and voluminous report pointed out that "with the exception of the Tennessee Valley, the East has been almost without multiple-purpose river basin programs. . . . Private interests have constructed single-purpose power projects on various rivers, but large amounts of usable hydroelectric power remains undeveloped."

Concerning the water development needs and opportunities of the region, the report pointed out that most of the water control and other facilities have been installed by local government or private industries and that there are no federal hydroelectric generating plants in the basin.

"These single-purpose projects have now gone as far as is possible without

Lyddon & Co.

exporters of wood pulp
to all world markets



Parsons & Whittemore

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wood pulp

London
Paris
Zurich
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10 East 40th Street, New York 16, N.Y.

creating serious conflicts," the report said, adding that redevelopment of some existing facilities offered opportunities for expansion.

"However," the report continued, "these developments will have to be integrated carefully with the present intensive use. To be most effective, they should be part of a basin-wide program."

Contended, on the other hand, the Western Massachusetts' Electric Company: The commission's findings are "completely idealistic—in other words, a part of the same old government pipe dream."

The company said that, for undeveloped power on the Connecticut River, the best available figures stand at about 111,000 kilowatts, including the proposed federal projects at Gaysville, Vt., and Enfield, Conn. To this, said the power company, should be added the development now under construction at Wilder, Vt., making a total of 139,000 kilowatts — about 27 percent over the present figure.

The power company also said that utility officials indicate that there are just over one million kilowatts of water power still unused in New England's rivers that "engineeringly" could be harnessed. The amount that could be "economically" be developed by private industry is only about half that amount, said the utility.

ERROL DAM ACTIVE AGAIN

PORTLAND, Me.—The Brown Co. and Oxford Paper Co. will be among the principal benefactors if the proposed Errol, N. H., water storage project goes through.

This project has been on the fire for some time. A new committee made up of Central Maine Power, Bates Mfg. Co., Brown Co., Oxford Paper, and Public Service of N. H. are actively studying the project.

The cost is estimated at $5 million for the dam and double this if power generators are included.

The whole project is important for flood control, stream flow improvement and full capacity operations.

GET TISSUE CONTRACT

HOLYOKE, Mass. — The American Tissue Mills received a defense contract, through the Quartermaster Corps on March 2 for $50,080.75 for tissue paper.

Defense Order Symbols

The National Production Authority, U. S. Department of Commerce, on February 28 made public the list of defense order symbols used at the present time in rating orders for production under the mobilization program.

The DO-rating system is a single-rating band, and NPA regulations require that all DO-rated orders be filled in advance of non-rated orders. Many materials and products needed for the defense program are in short supply, and the purpose of the single-band priorities system is to assure that defense and defense-supporting production has the right of way.

The two-digit code numbers assigned to the various DO ratings are purely for purposes of identifying the program to which the order is related, or the claimant agency, and do not indicate any preference, NPA emphasized. Rated orders are to be accepted in the order in which they are received.

The code numbers assigned to the various progrems, subject to change from time to time, are as follows:

DO Code No.	Agency Programs	Major Program Involved
01	Department of Defense	Aircraft
02	Department of Defense	Guided Missiles
03	Department of Defense	Ships
04	Department of Defense	Tank-Automotive
05	Department of Defense	Weapons
06	Department of Defense	Ammunition
07	Department of Defense	Electronics and Communications Equipment
08	Department of Defense	Fuels and Lubricants
09	Department of Defense	Clothing and Equipage
10	Department of Defense	Transportation Equipment
11	Department of Defense	Building Supplies and Equipment for Overseas Construction
12	Department of Defense	Subsistence
19	Department of Defense	Production Equipment
21	Department of Defense	Miscellaneous
22	Department of Defense	Contract Construction
35	Economic Cooperation Adm.	Foreign Additional Military Production
36	Economic Cooperation Adm.	Foreign non-Military Production
37	Office of International Trade	Foreign Production (other than E.C.A. non-Military)
40	Atomic Energy Commission	Operations
41	Atomic Energy Commission	Construction
42	Atomic Energy Commission	Construction Equipment
43	Atomic Energy Commission	Privately Owned Complete Facilities
44	Atomic Energy Commission	Privately Owned Facilities Additions
45	National Production Authority, Civil Aeronautics Adm., and National Advisory Committee for Aeronautics	Miscellaneous
46	National Production Authority	Industry Plant Expansion
47	National Production Authority	All Canadian Program
48	Department of Interior	All Programs
49	Department of State	Voice of America
60	U. S. Coast Guard	Miscellaneous
61	U. S. Coast Guard	Aircraft
62	U. S. Coast Guard	Construction
63	U. S. Coast Guard	Ships
97	National Production Authority (or delegatee)	Maintenance, Repair and Operating Supplies
98	National Production Authority (or delegatee)	Production Equipment for Certain Private Contractors
99	National Production Authority (or delegatee)	Basketing (Small orders bunched together under NPA Reg. 2)

(Digits 50 and 51 were formerly used by the National Advisory Committee for aeronautics. Digits 55, 56 and 57 were formerly used by National Production Authority for Canada.)

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Condenser | Grease Proof | Snap-out Forms | Aero-engine Parts

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POSITIONS OPEN

We can place—superintendent Cylinder board mill; asst. wet machine mill; asst. gen. manager Cylinder machine specialty mill; asst. Fourdrinier and Cylinder machine mill on wide variety of papers.

P.S. Salesmen and Sales Engineers for paper mill machinery

Master mechanics; mechanical and plant engineers, designers and draftsmen; chemists and chemical engineers; machine foreman on rag and fine papers; machine tenders and back tenders; paper salesmen.

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CHARLES P. RAYMOND SERVICE, Inc.
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SPECIALISTS IN PLACING PULP AND PAPER MILL EXECUTIVES

M-10

AGGRESSIVE SALES ENGINEER

Opportunity to join well-known established machinery firm. Technical ability and paper making background necessary. Knowledge of beating and pulping process and equipment desirable. Some sales experience or sales inclination helpful. Must be able to travel in territory. Tell us about yourself in your letter. Address Box 51-119 care Paper Trade Journal. M-16

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SALARIED POSITIONS $3,500 to $15,000. We offer the original personal employment service (established 41 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. TF

BAG MACHINE ADJUSTOR—must be first class adjuster on Potdevin, Weber SOS Machines. Equally experienced on sacks. Flat and square machines, also dry cleaning bag machine. Knowledge of printing necessary. Address Box 51-112, care Paper Trade Journal. M-30

EXPERIENCED PAPER MACHINERY DESIGNER with special knowledge of reels, winders and cutters. Excellent opportunity with well established company. Address Box 51-49 care Paper Trade Journal. TF

EXPERIENCED MACHINE TENDER to operate a single counter flow cylinder machine making specialties and lightweight papers for mill located in New England. Speeds, 300 to 400 feet, and deckles 80" to 90". Apply stating age, experience, family status and references to Box 51-110 care Paper Trade Journal. M-16

WANTED—25 experienced paper mill Design and Layout Engineers. Men required for steel and concrete structural design, mechanical layout, piping design, and electrical design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga. A-13

WANTED — SALES ENGINEER — Experienced in Pulp and Paper Mills, for sales and service work. Excellent opportunity with old established machinery manufacturer. In reply, give resume of education, experience and current salary. Address Box 51-86 care Paper Trade Journal. TF

WANTED—TOP GRADE MAN fully experienced, for manager of an eastern chipboard mill. Furnish details of experience and references. Excellent opportunity. Address Box 51-78 care Paper Trade Journal. TF

WORKING SUPERINTENDENT for small, fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 51-86 care Paper Trade Journal. TF

UNUSUAL OPPORTUNITY with progressive concern for an experienced pulp mill engineer. Must have chemical background and know kraft bleaching. Location in New Jersey. Address Box 51-123 care Paper Trade Journal. M-30

EXPERIENCED SALES ENGINEER on Fourdrinier and Cylinder Machines and auxiliary equipment, free to travel, by well established machinery builder. In reply state background, experience, etc. Address Box 51-122 care Paper Trade Journal. M-16

MACHINE TENDERS, Back Tenders and Windermen for Yankee Fourdriniers running light weight tissues. High hourly rates, six and seven days per week. Paper Maker's Union. Southern Michigan mill. State age, experience, etc. Replies to Box 51-115 care Paper Trade Journal. M-16

MACHINIST—Experienced in paper mill operation. Good, steady work. Good working conditions, good labor relations. Call collect TARENTUM 1470. Ask for Bill Hilty. M-16

SITUATIONS WANTED

PAPER MILL SUPERINTENDENT TWENTY-FIVE YEARS OF PRACTICAL EXPERIENCE manufacturing folding boxboard, writing, book, twisting, sulphite specialties, groundwood specialties, kraft specialties. Well experienced in stock preparation for above grades. Run mill economically. Best of references. Address Box 51-60 care Paper Trade Journal. M-23

PLANT MANAGER—Paper and Board and their conversion; wants challenging opportunity. Highly successful in organization; administration; labor relations and high level production. Presently employed. Address Box 51-63 care Paper Trade Journal. M-30

HIGH GRADE BEATER ENGINEER seeks difficult position. Experience covers rope, rag bonds and sulphite specialties. Expert color man. Demands good salary and earns it. Age fifty-six. Address Box 51-100, care Paper Trade Journal. M-23

MASTER MECHANIC—25 years experience in maintenance and construction; steam engineering. Age 44. Addres Box 51-84 care Paper Trade Journal. M-16

MANAGER — FOURDRINIER PAPERS. Knows details of manufacture. Many years with America's finest mill. Can build smooth organization. Address Box 51-101 care Paper Trade Journal. M-23

TECHNICAL ADVISER to assist executive. Chem. Eng. Experienced in paper making processes, materials and mill operation. Address Box 51-108 care Paper Trade Journal. M-16

SALESMAN with considerable mill merchant experience, desires change to a position of wider responsibilities. Particularly well equipped to handle fine printing papers. Addres Box 51-104 care Paper Trade Journal. M-23

PAPER MILL ENGINEER—Plant Engineer with design experience sulphite pulp, cylinder and Fourdrinier specialties, desires connection. Address Box 51-121 care Paper Trade Journal. TF

PAPER MILL ENGINEER with managerial experience and cost control minded, desires a change offering greater opportunity. Address Box 51-118 care Paper Trade Journal. A-6

SITUATIONS WANTED

PRODUCTION MAN—Wants job where technical education, broad experience and ability to get things done will work to advantage. Capable organizer and administrator. Not afraid of difficult assignments nor hard work. Address Box 51-120 care Paper Trade Journal. M-16

KRAFT MILL MAN with chemical training and 30 years successful experience with production, quality and cost control, using soft and hard woods; also experienced in getting new plants ready and into operation. Anyone interested please address Box 51-128 care Paper Trade Journal. M-30

FOR SALE

CAUSTIC SODA EQUIPMENT

1—Complete continuous automatically controlled caustic soda diluting and make up system; consisting of: specific gravity and temperature recorders, Ketometers, automatic temperature controllers;
3—Brine cooled agitated tanks, 9000 gallons each.
2—Holding tanks 24,000 gallons each; all piping, motor driven centrifugal pumps, etc., etc.
5—Corini Dializors Models 80-D. (50 Diaphragm) complete (Sufficient new bags for 3 dializors.)

CONSOLIDATED PRODUCTS CO., INC.
Box 70 Woonsocket, R. I.
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CARDBOARD STOCK

15 PT. APPROX. 40 TONS
Ready For Immediate Delivery
PRIME CONDITION

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2—New Inlets and Head Boxes.

1—36" high x 153" Deckle.

1—36" high x 139" or 143" deckle.

For 300 to 800 F. P. M. wire speed.

VALLEY IRON WORKS COMPANY
Appleton, Wisconsin
M-23

FOR SALE—Duplex Cutter, 120" Hamblet, complete with Moore & White power driven lay boy and power lowering and raising for skid channels, Maxson overlapping delivery, Simco static eliminator and 6 roll back stand. Lee Paper Company, Vicksburg, Michigan. M-23

FOR SALE—74" Knowlton Traveling Shear Cut-off Knife.—Bargain. Address Box 51-105 care Paper Trade Journal. TF

FOR SALE—One Bagprint B-10 flat and square bag machine, mfg. size 3x5 to 8½x18. Can presently be seen in operation. Address Box 51-97 care Paper Trade Journal. M-30

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245 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING PAPER MAKING EQUIPMENT — NEW, USED, REBUILT PAPER AND PULP MACHINERY

MACHINERY WANTED FOR OUTRIGHT PURCHASE

Paper Machines, Paper Mill Machinery and Converting Equipment.

WE OWN WHAT WE ADVERTISE

BEATERS
2—Dilts 750 lb. Iron Tub Roll 44" face x 50" diameter.

BELTING—NEW
67 feet 8" 15 ply Goodyear Rubber Belting.
150 feet 8" 4 ply Silver Duck Transmission belt.

CALENDER ROLLS
46 Chilled Iron Rolls—Assorted sizes.

CONVEYOR
1—18½ ft. long x 30" wide—with motor.

CORE CUTTERS
1—Cameron with 2" x 1½" mandrels.

COUCH ROLLS—Rubber
1—110" face x 20" diameter. New.

CYLINDER MOLDS
1—134" face x 58" diameter, with stainless steel shafts.

DRIVER—ENCLOSED HERRING BONE GEAR
2—Falk right angle 75 hp—ratio 6.31-1.
1—Falk straight 200 hp—ratio 1.27-1.
1—Falk straight 150 hp—ratio 3.12-1.
Above complete with clutch pulleys.

DRYERS
3—124" face x 48" diameter.
3—60" face x 36" diameter.
1—72" face x 48" diameter—with gear.
1—130" face x 18" diameter—Baby Dryer.
58—128" face x 42" diameter.
1—60" face x 36" diameter.
1—160" face x 48" diameter, with bearings.
3—100" face x 42" diameter—with gears and bearings.
3—18" face x 42" diameter with bearings and gears.
1—112" face x 48" diameter.
1—64" face x 30" diameter.
1—100" face x 42" diameter Crossing Dryer.
11—54" face x 42" diameter with two dock frames, gears, bearings, steam joints.

FILTER PRESS
1—New Sperry filter press, size 12, type 41.

FILTERS
1—Oliver Vacuum Filters, Cylinder 10' face x 5'6" diameter. Steel vats. 1200 GPM capacity.

FLAT SCREENS
3—8 pickle Sandy Hill Roller Shoe with scrapers.
6—Harmon 12 plate.
3—Sandy Hill 12 plate roller shoe.

JORDANS
1—#0 Miami, for motor drive.
1—Jones Majestic with base and couplings—
2—#3 Appleton with base and coupling.
1—Jones Majestic, Stainless Steel Fitting.

LAMINATOR
1—Downingtown 52" Laminator, with 4 Dryers 48" diameter.

PULP EQUIPMENT
1—Nitts & Merrill #17 Pulpwood chipper.
1—Bird ball bearing Pulp Screen. Practically new. Used 6 months.
4—APMEW Ball Bearing Pulp Screens—30 ton capacity.

PULPERS
2—#2 Lamson with enclosed Falk Drives. New.

PUMPS
44—Centrifugal Pumps, open & closed impellers. Direct connected or Belt Drives. Extended base for motor. Assorted capacities and heads. Most used less than one year. Also new Goulds Pumps.

REDUCERS
1—Link Belt 40 h.p. Ratio 2.2-1, 880 r.p.m.-227 r.p.m.

REFINERS
1—Sprout, Waldron, 10th 400 HP, 440 volt, 3 phase, 60 cycle motor and starter—Practically new.

ROLLS—PRESS COUCH, etc.
32—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY SCREENS
4—22A Bird, fully rebuilt with new vats, plates, etc.—enclosed drive.
1—22 Bird—stainless steel vat.
1—22 Bird—bronze vat.

SAVEALLS
1—Oliver, Vacuum type cylinder 120" face x 60" diameter, with steel vats.

SCREW PRESSES
1—Valley Voith Screw Press Size 2.

SHEETERS
1—48" Kidder Reel Sheeter.
1—64" Duplex Dillon with 15 roll Back Stand.

SHREDDERS
1—American 37" Hammermill, anti-friction bearings.
1—Sprout Waldron Cutter—type F-11—30" knives. Used 30 days.

SLITTERS AND WINDERS
1—Pusey & Jones 100" high speed slitters and rewinders.
1—Kidder 120" Paper Machine Slitter and Winder—52" rewind.
1—Moore & White 120" Four Drum Paper Machine Slitter and Winder—52" rewind.
1—Beloit 120" Paper Machine Slitter and Rewinder—52" rewind.
1—52" Langston Type 2 shaft rewinder.

STOCK PUMPS
3—Beloit 10 x 20 Triplex with silent Link Belt Chain Drives.
1—Shartle 10 x 20 Duplex.

SUCTION COUCH ROLLS
1—Millspaugh 22" diameter x 130⅝" svelite face.
1—Millspaugh 22" diameter x 188" drilled face.
1—Beloit 24" face x 10" diameter—Ball bearing.

SUCTION EXTRACTOR ROLLS
1—Downingtown Suction Extractor Roll 110" face x 24" diameter. Anti friction bearings.
1—Downingtown Suction Extractor Roll 132" face x 24" diameter. Anti friction bearings.

SUCTION PRESS ROLLS
1—Millspaugh 131" drilled face x 22" diameter with stand & drive.

WATER FINISH UNIT
1—Valley Micronist Unit for water finish on paper—120" double.

WAXING MACHINE
1—Waldron 40" Waxer and Impregnator.

WHY LIST YOUR EQUIPMENT? — WE WILL BUY IT.

PAPER MACHINE

Cylinder mould 36" x 100" with cypress vat and shower. Some spare wires. This mould is also equipped with two suction fans motor driven (motors) included one ten HP and one three HP.

Ten—Felt carrying rolls averaging 8" dia. by 112" face, with bearings, anti-friction.

One—top couch rubber covered, plastometer about one hundred fifty. 12" dia. x 103" face.

One—18" dia. x 109" face pressure roll, sleeve type bearings with arms and leverage system for loading.

One—8 ft. dia. x 103½" face Yankee dryer with steam piping (includes 2" Davis steam pressure regulator and trap.) Also includes drive consisting of fifty HP and nine hundred Westinghouse motor with resistance tanks and drum controller. One silent chain drive motor to jackshaft, spur gear drive jackshaft to dryer.

Two—custom made doctors.

One—Horizontal felt stretcher.

Two felt showers. (Two suction boxes)

One—Rice Barton and Fales calender stand with one 18" x nine foot roll and one 11" by nine foot roll. No drive.

One—Special drum reel with Reeves 008 vari drive.

One—Special rewinder and slitter with drives.

One—6" x 12" vertical single cylinder stock pump. No drive.

One—Stainless steel multiple section stuff box. No piping.

We understand electrical equipment is for three phase, sixty cycle and 440 volt.

FRANK H. DAVIS COMPANY

175 Richdale Ave. — Cambridge 40, Mass.

M-23

FOR SALE

CAMERON SLITTERS

1—42" and 1—32" type 24—Model 3A Duplex.

1—40" type 40.

1—32" type 40—Model 2A.

OTHER SLITTERS

1—60" Hammersly.

1—45" Hudson-Sharp. For cutter box and shelf roll papers.

1—42" Langston Center Wide Duplex S&R.

1—30" Langston Type A Shear-Cut S&R.

1—30" Fales—Model B.

POWER PAPER CUTTERS

8—Seybold: 38", 54" and 64" 20th Century, 50" 102, 46" 6Z, 50" Precision with Auto-spacer, 50" Dayton; 54" Holyoke; 3—Oswego: 38", 44" and 57"; 1—Sheridan 50"; 1—Dexter: 57"; 2—Acme: 32" and 42"; 1—S&W Under Cut 63".

OTHER EQUIPMENT

1—48" Mayer Coating Machine Co.'s gumming machine for Kraft paper.

1—Paper Converting Machine Co. ¼ fold, 3 web napkin folder with embossing attachment.

2—Hudson Sharp, 3 deck napkin folders 10" x 10", with embossing attachments.

1—Potdevin Model 83 Sack Machine. 1 to 5 lb. range.

2—Lockport Flat & Square Bag Machines. One #2, one #3.

1—20" Champlain 4-color Rotogravure Press.

1—32" 3-color Baggrint Machinery Corporation's Aniline Printing Press for tail-printer on Bag Machine.

1—NEW 24"—3-color aniline roll to roll press.

1—82" Single Hamblet Sheeter, 8 roll double deck backstands, Slitting attachment and automatic overlapping delivery, Erie Layboy with blower and static eliminator. Automatic inserting ream counter.

1—102" Beloit Duplex Rotary Sheeter, 10 roll backstands and M&W Layboy.

3—Duplex Sheeters, 1—64" Dillon and 1—94" Moore & White.

1—40" Norwood plater. AC reversing motor equipment.

1—45" German, Dornbusch Embossing machine with two sets of embossing rolls.

1—38" Holyoke Roll to Roll Embosser. Heavy Type.

1—42" Hobbs Mfg. Co.'s Embosser, ball bearing throughout.

3—Potdevin Squeeze Roll Waxing Machines, one 80", one 82" and one 84" wide.

1—14" x 28" Meisel, R.F.B. & P. Press, with all attachments for continuous register forms.

1—46" 6 Roll, 1—67" 9 Roll and 1—84" 9 Roll Holyoke Super Calender Stacks.

1—1000# Iron Tub Beater. Roll 48"x48"—72 bars.

2—#2 Moore & White Screens. Plates cut .020".

1—Lamnoye Pulper.

1—60" Meisel 3 color Roll to Sheet Adjustable Rotary Printing Press. Centered printing to register on sheets 20" to 30" in length by ⅛".

GIBBS-BROWER COMPANY, INC.
Reply to Room 903
21 East 40th St., New York 16, N. Y.
M-16

FOR SALE

FOR SALE—1 VALLEY IRON WORKS STOCK INLET. Used with 132 inch wire making 10 pound to 40 pound paper. From 350 to 600 feet per minute. Print will be furnished interested parties.

DUNN PAPER CO.
Port Huron, Michigan M-16

CURRENT OFFERINGS

42" Moore & White Sheeter, with or without layboy.
58" Finley Sheeter.
84" Hamblet Sheeter, only 6 yrs. old, with 8 roll Back Stand.
100" Horne single knife Sheeter.
68" Oswego mill type Power Cutter, with power back gauge.
Morrison #4 and 32 L. G. Box Stitchers.
Model 45 Economy Hand Baler.

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FOR SALE—Two 81" Toilet Tissue Rewinders, and one 77" Towel Rewinder. Price $2,000.00 each, F.O.B. Phila. New, machines in operation. Address Box 51-124 care Paper Trade Journal. M-16

FOR SALE—84" Seybold 20th Century Automatic Power Cutter, mill type, with 7½" H.P. A. C. motor; in good working condition, immediately available. Address Box 51-26 care Paper Trade Journal. M-23

WANTED

WANTED

One slitter and re-winding machine, approximately 30" suitable for small widths and diameters. We want to manufacture adding machine rolls, teletype rolls, etc. Machine must be in good working condition. Will pay cash. What can you offer?

Box 51-116 care Paper Trade Journal. M-16

WANTED

Serviceable Grocery Bag Machine
8 through 20 lb. sizes.
Recent Model Potdevin preferred.

Address Box 50-450, care Paper Trade Journal, TF

WANTED—TOILET TISSUE—Jumbo Rolls (Bleached and unbleached) in carload lots. Address Box 51-16 care Paper Trade Journal. TF

WANTED

WANTED

SINGLE INTERFOLD TOWEL MACHINE

SIZE 10" x 10"

Address Box 51-127, care Paper Trade Journal. M-16

WANTED—Brightwood Box Machine, Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 51-88 care Paper Trade Journal. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 51-89 care Paper Trade Journal. TF

WANTED—8 Cast iron Dryers 46" to 54" face, 36" diameter; 8 Cast Iron Dryers 38" to 44" face, 36" diameter. Might consider other diameters. Also have assortment of used pulleys for sale. Address Box 51-109 care Paper Trade Journal. M-23

WANTED—One 40" Waxer, either Hudson Sharp or Mayer with or without chill unit. Address Box 51-98 care Paper Trade Journal. M-30

WANTED—Paper for gypsum board and lath. Any quantity from 10 to 500 tons or regular monthly shipments. Address Box 51-85 care Paper Trade Journal. M-16

SIDE RUN—continuing use for 12⅞" and 14¾" 40 lb. natural brown Kraft or other colors. Please send full details to Box 51-[illegible] care Paper Trade Journal. M-[illegible]

WANTED—Used Vacuum Washer. Any size or construction considered. Green Bay Paper and Pulp Co., Green Bay, Wisconsin. Phone Howard 8259. M-[illegible]

WANTED—Four or Six 3' Dryers 72" to 74" wide, complete with frames, gears, etc. OSWEGO RIVER TISSUES, INC., Phoenix, New York. M-[illegible]

WANTED— TO PURCHASE—92" to 100" Fourdrinier Wet End. Reply to SANGAMON PAPER MILLS, 137 W. Pershing Rd., Chicago, 9, Illinois. M-[illegible]

WANTED—One NASH L-9 Vacuum Pump. Address Box 51-117 care Paper Trade Journal. M-[illegible]

WANTED—Interfold towel machine capable of making junior and midget flat towels. Address Box 51-114 care Paper Trade Journal. M-[illegible]

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Ambitious, experienced and reliable young gentleman of thirty-five, with modest starting capital wishes to make contact with a partner who wishes to retire in the near future, with a view to obtaining a mutually satisfactory arrangement of purchase. References and abilities to be discussed upon meeting. Please reply to Box 51-107, care Paper Trade Journal. M-23

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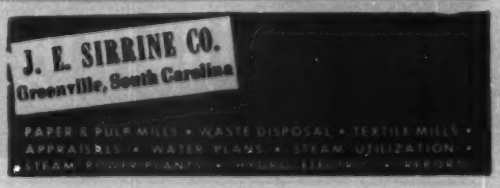
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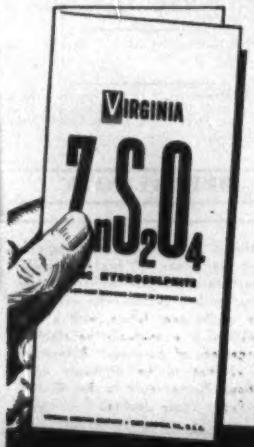

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Norton Co.

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The Goodyear Tire & Rubber Company
Monsanto Chemical Co.
Mortingstar, Nichol, Inc.
National Starch Products, Inc.
Napco Chemical Co.
Plaskon Division, Libbey-Owens-Ford Glass Co.
Stein, Hall & Co., Inc.

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Valley Iron Works Co.
Shartle Brothers Machine Co.

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Potdevin Machine Co.
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Weber, Herman G., & Co., Inc.

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Carthage Machine Co.
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Valley Iron Works Co.

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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
SKF Industries
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Dilts Machine Works
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Morden Machines Co.
J. J. Ross Company
Ross Paper Machy. Co.
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Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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Goodrich, B. F., Co.
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Rohm & Haas Co.
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The Sandy Hill Iron & Brass Works
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Moore & White Co.
Murray Mfg. Co., D. J.
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Combustion Engineering-Superheater, Inc.

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Lobdell Co.
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The Moore & White Co.
Perkins & Sons, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

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Williams-Gray Co.

CASEIN
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Bunge Pulp & Paper Co.
Hercules Powder Co.

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Black Clawson Company
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblett Machine Co.
Lobdell United Co.
Magnus Metal Corp.
Michigan Steel Casting Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

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Bird Machine Co.
Nichols Engrg. & Research Corp.
Rust, J. O., Engrg. Co.
Shartle Brothers Machine Co.

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Stephens-Adamson Mfg. Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

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Calgon, Inc.
Dow Chemical Company
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General Dyestuffs Corp.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gutzeman & Co.
Hercules Powder Co.
Hooker Electrochemical Co.
The Kinsley Chemical Company
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Niagara Alkali Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Rohm & Haas Co.
Virginia Smelting Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Kalamazoo Tank & Silo Co.
Shartle Bros. Mch. Co.

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Monsanto Chemical Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co.
Wyandotte Chemicals Corp., J. B. Ford Division

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Black Clawson Company
Farrel-Birmingham Co.
Moore & White Co.
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The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
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The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

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The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pittsburgh Division, Libbey-Owens-Ford Glass Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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John Waldron Corp.
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Industrial Brownhoist Corp.
Whiting Corp.

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Thwing-Albert Instrument Co.

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General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
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General Dyestuff Corp.
Nopco Chemical Co.

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Blaw Knox Company
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Lukenweld
Pusey & Jones Corp.

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Paper & Industrial Appliances

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General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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Black Clawson Company
Diltz Machine Works
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Fairbanks, Morse & Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
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Valley Iron Works Co.
Westinghouse Electric Corp.

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DRYER DRAINAGE
Stickle Steam Specialties Co.

DRYER ROLL PYROMETER
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John Waldron Corp.

DUSTING BRUSHES
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Bunge Pulp & Paper Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.

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Egan, Frank W., & Co.
John Waldron Corp.

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B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

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Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
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Vanderbilt Co., R. T.

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Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

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Ross Engineering Co., J. O.

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Shartle Brothers Machine Co.
Waldron Corp., John

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Hungerford & Terry, Inc.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
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Towmotor Corp.

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Williams Apparatus Co., Inc.

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Downingtown Mfg. Co
The Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co

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Williams Apparatus Co.

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Black Clawson Company
De Laval Steam Turbine Co.
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Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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GRINDING WHEELS
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Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
John Waldron Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
The Sandy Hill Iron & Brass Works

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E. D. Jones & Sons Co.
General Electric Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
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HUMECTANTS
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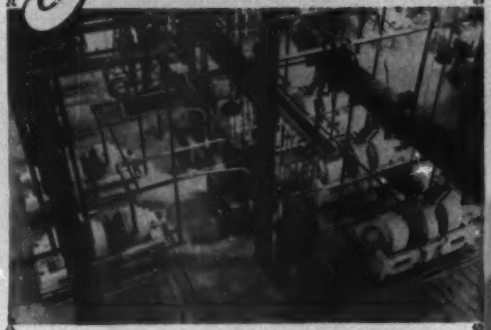
Semichemical chips defibered by 5 Bauer Pulp Refiners



The above reproduction fails to do justice to one of the most spectacular commercial photographs we have ever seen. It was taken by Lefebvre-Luebke at the new mill of Green Bay Paper & Pulp Company, and is published by us with permission.

Here are five Bauer Pulp Refiners arranged in lines of three and two machines respectively. Semichemical chips are fed to the refiners through chutes. Each chute is equipped with a Bauer Permanent Magnetic Separator for removing tramp iron. Water is added to the chips by showers in the chutes to effect the desired consistency for fiberizing. Subsequent showers are used for further diluting the pulp.

This is an example of the hundreds of Bauer Pulp Refiners in operation throughout the world for pulp and stock processing. The materials treated include raw, steamed, extracted, or semichemically cooked chips; many types of screen rejects; raw pulp, old paper, straw, and numerous kinds of fibrous residues.

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Illustration from the Bettmann Archive

When Paperboard was Made the Hard Way

Nearly two hundred years ago in France, heavy paperboard was used primarily for two purposes —for hat boxes and for the binding of books. The process of making the heavy paperboard from rags was shown in the above illustration in the French Encyclopedia, published by the Academy of Sciences in Paris in 1763.

It was sixty-five years later, in 1828, that G. A. Shryock developed at Chambersburg, Pa., a method of making paperboard from straw. "Many predicted," he wrote years after, "that these boards would become one of the indispensable products of the world." But straw was limited in its usefulness. Thirty-seven years later Benjamin Tilghman, a Philadelphia chemist, invented, in 1865, the sulphite process of manufacturing wood pulp. He was the first to see the far-reaching effect of this method in making plentiful paper possible. Such long, slow strides led eventually to the vast paperboard industry of today. Now paperboard is so extensively used for shipping containers and other purposes that it accounts for practically half the total production of the great pulp and paper industry.

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